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ABSTRACT

This report discusses the findings of the three year Interfutures Project which studied the future development of advanced industrial societies and the relations between these countries and the developing countries. The major emphasis of the project was to analyze economic problems. However, political and social elements were also studied. The purpose of the report is to incite awareness and action. There are five parts and a conclusion to the report. Part I analyzes the political limits to population growth. Part II examines past trends and future dimensions. How the industrial societies cope with change is the topic of Part III. Part IV discusses the advanced industrial societies and the third world. Problems of the third world countries, interdependence between developed and developing nations, and developed countries' strategies in regard to the third world are examined. Part V looks at the growth of world interdependence. Recommendations discussed in the conclusion include the following. Everything must be done to improve the knowledge of other cultures. More travel abroad by young people (especially to developing countries), translation of writing from different cultural areas, and distribution of cinema and television features made or filmed in these areas would help create a greater awareness of the world outside. Third world countries should have improved access to medium and long term loans. International foundations to sponsor third world centers of applied research in different sectors of technology should be set up. (Author/RM)

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INTERFUTURES

FACING THE FUTURE

Mastering the Probable
and Managing the Unpredictable

SO 013 321

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

The Organisation for Economic Co-operation and Development (OECD) was set up under a Convention signed in Paris on 14th December 1960, which provides that the OECD shall promote policies designed:

- to achieve the highest sustainable economic growth and employment and a rising standard of living in Member countries, while maintaining financial stability, and thus to contribute to the development of the world economy;
- to contribute to sound economic expansion in Member as well as non-member countries in the process of economic development;
- to contribute to the expansion of world trade on a multilateral, non-discriminatory basis in accordance with international obligations.

The Members of OECD are Australia, Austria, Belgium, Canada, Denmark, Finland, France, the Federal Republic of Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

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"Time present and time past
Are both perhaps present in time future,
And time future contained in time past"

T.S. Eliot in Burnt Norton

FOREWORD

1. Following an initiative by the Government of Japan in May 1975, a major new research project was established within the framework of the OECD on 1st January, 1976, to study "the future development of advanced industrial societies in harmony with that of developing countries"(1). The project, now referred to as INTERFUTURES, ran for a period of three years to 31st December, 1978.

2. The primary purpose of the project, as laid down at the outset by the OECD Council, was: "to provide OECD Member Governments with an assessment of alternative patterns of longer-term world economic development in order to clarify their implications for the strategic policy choices open to them in the management of their own economies, in relationships among them, and in their relationships with developing countries".

3. The report is based on the research of an international team which was specially constituted for this purpose under the leadership of Professor Jacques Lesourne, the final drafting and editing having been done by a reduced project-team consisting of Messrs. J. Lesourne, W. Michalski, M. Sakamoto, D. Norse, D. Malkin and C. Comeliau. Throughout the project's life, the team received comments and observations from an Advisory Panel of eminent personalities, and from a Steering Committee in which all contributing governments were represented(2). The views expressed in the Report, however, are those of the Project team and should not be attributed to either Member Governments or to the Organisation. In view of the interest of the research, I have deemed it useful to publish the Report under my own responsibility.

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(1) Nineteen OECD Members (Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the United Kingdom and the United States) and the Commission of the European Communities contributed to the project. The Toyota Foundation, the Ford Foundation and the German Marshall Fund of the United States provided grants to the project.

(2) The members of the Project Team, of the Advisory Panel and the officers of the Steering Committee are listed in Annex I.

4. The INTERFUTURES project is of particular importance and interest in an era of rapid and constant change. The Report analyses prospects, constraints and issues in the longer-term perspective of the developed countries with particular attention to such subjects as possible physical limits to growth; the interaction between growth, structural adaptation and value changes; as well as relations with developing countries and the interaction between the policies and progress of developed and developing countries, without neglecting the centrally planned economies.

5. It is clear that the contents of this report cannot be taken as forecasts, still less as predictions of what the future holds for the world economy. By exploring an uncertain future, I trust that it will contribute to government thinking and decision-making. As we enter the last two decades of the century, we will be faced with a number of challenges which governments will have to deal with both individually and collectively. Among the issues the INTERFUTURES Report addresses in the wide-ranging framework of growing interdependence and better management of the world economic system, the following should be singled out : the energy transition, the new conditions of growth; the need to deal with the rigidities which impede the development of national economies; the redeployment of industry; structural change and new values and the need to achieve greater equity and better distribution of the world's goods not only between, but within nations as well.

6. All these issues of course have direct relevance for current economic co-operation with OECD. It is envisaged, in a follow-up phase, that the activities of the Organisation and its Committees take into account the longer-term dimensions of issues, drawing on the work of the INTERFUTURES team.

Emile van Lennep

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INTRODUCTION

The OECD Council decision of 1975

This report sets out the main results of the INTERFUTURES project. This three-year project on "the future development of advanced industrial societies in harmony with that of developing countries" was launched at the end of 1975 by the Council of OECD.

This report sets out the main results of the INTERFUTURES project.

It was at the end of 1975 that the Council of OECD decided to launch this three-year project to study "the future development of advanced industrial societies in harmony with that of developing countries".

The considerations which motivated that decision are now more topical than ever (1) :

> "A number of new problems have emerged which have important implications both for the advanced industrial countries and with regard to their relationship with the developing countries. Difficulties in maintaining growth and full employment, supply and demand imbalances in markets of important commodities, inflation, unprecedented balance-of-payments problems, concern about the new patterns of trade, investment and monetary relations and the growing imbalance between the developed and the developing economies are typical examples of such problems".
>
> "OECD Member governments are thus faced with the question of whether and how it will prove possible to ensure future prosperity and balanced economic and social development in harmony with the developing countries. However, pressed by immediate problems, they have on the whole had little opportunity to consider the longer-term prospects and their implications for current policy decisions".

The objectives that evolved from these considerations were clearly spelled out in the terms of reference of the project :

---

(1) Paragraphs 1 and 2 of the appendix to the Council decision.

> "Future-oriented analysis would be carried out, identifying the key factors and their relationships, assessing likely future developments and emphasising their implications for short and mid-term policy options:
>
> (a) an assessment of longer-term economic developments and relationships among advanced industrial societies,
>
> (b) an assessment of longer-term developments in the relationships between the advanced industrial societies and the developing countries,
>
> (c) an assessment of potential physical constraints and opportunities related to energy, raw materials or the environment on future development,
>
> (d) an assessment of the future evolution of international economic structures and systems in response to growing interdependence".

The characteristics of INTERFUTURES

Several important characteristics set the INTERFUTURES project apart from other world forecasting exercises.

As the project's initiators had directed, INTERFUTURES therefore had three characteristics which, from the outset, distinguished it from other world future-oriented studies :

(i) The project was to analyse simultaneously the longer-term internal problems of the developed countries (i.e. both within and between them) and relations between these countries and the developing countries. A dual approach of this kind is rather rare in current world studies. Some focus mainly on the problems of the South and urge that measures be taken by the governments of the developed countries, while failing altogether to analyse the conditions which would have to prevail in these countries for such measures to be possible; others discuss new lifestyles in the post-industrial developed countries, as if these countries could in future be an isle of bliss, having no contact with the surrounding ocean of poverty.

(ii) The project was to consider how the governments of the developed countries could adapt their short-term activities to improve their incorporation into global and longer-term approaches to the problems. Thus, it was not an academic project concerned with the future per se, but a project designed to bring out problems and investigate the consequent policy options open to the developed countries.

(iii) The project was intergovernmental. This greatly facilitated communications between national governments and the research team, but implied, in return, that the team would make efforts to encourage exchanges of views between governments on longer-term questions.

The fact that the project was intergovernmental must not give rise to any misunderstandings, however; the research has been carried out by an independent team within the OECD Secretariat, and the final report drafted on the responsibility of the project's Director. While governments have followed the preparation of the report, they have in no way taken a position with regard to its content. In any case, what value could an official version of the future have?

The options of the research team

The INTERFUTURES project was based on a few main options :
- *an effort in prospective analysis;*
- *an attempt to perceive interdependence without losing sight of specific problems;*
- *a mainly economic reading, but one which accommodates political and social elements;*
- *research aiming at an understanding of the problems with which OECD governments will be confronted.*

But in addition to these three features, there are those resulting from the choices made by the research team. The problems of the world are so complex and so vast, and the methods used to analyse them so diverse and so frail that a small team with scarcely two years at its disposal (given the time necessary to launch the project) could not hope to tackle every really important subject. Also, despite taking the precaution of canvassing a broad range of views, the members of the team could hardly fail to be partially conditioned by their own disciplines, the institutions to which they belonged, cultural attitudes in their countries of origin and the atmosphere of an intergovernmental organisation. However, to admit the limitations which are bound to apply to an exercise of this kind in no way reduces its interests, even if it brings out the need to develop similar studies in different contexts throughout the world.

The INTERFUTURES project was based on a small number of options which must now be described.

(a) An effort in prospective analysis

INTERFUTURES was conceived as an attempt at prospective analysis, not as a forecasting exercise. Prospective analysis recognises that an attempt must be made to imagine the different futures that could result from the behaviour of the actors involved within the limits of the systems through which they act. It attempts, therefore, to distinguish trends whose dynamics are almost invariant from those which can be affected by the decisions of the actors concerned and by uncertain events. It endeavours to grasp the projects which these actors will seek to implement and which will shape their future behaviour. These actors will create and invent new solutions.

One of the main outcomes of this decision in favour of prospective analysis has been the construction of global or partial scenarios worked out at different levels. These scenarios offer pictures of the future at certain time horizons and describe the paths that lead there. Their interest lies in the light they throw on the possible policies of certain actors, particularly governments.

(b) An attempt to perceive interdependence without losing sight of specific problems

Any exercise in world prospective analysis is bound to position itself in relation to two extremes :

. One is to concentrate on bringing out interdependences, incorporating the relations considered essential in a world model. Appreciable progress has been achieved in recent years using this approach, but its deficiency is that it can propose only an over-simplified picture of the world, one in which the various specialists do not recognise their own problems and which at the same time is too general to provide a base for decision-making by governments.

. The other is to analyse specific problems, drawing on the considerable fund of expert knowledge - particularly of technological and economic questions - available in the major developed countries. But in this case, although the concrete aspects are never lost sight of, it becomes impossible to tackle the difficulties that stem from the interrelations between different fields.

INTERFUTURES has attempted to steer a middle course, starting out from analysis of specific problems and working gradually towards an understanding of interdependences (1).

(c) An approach which is primarily economic but accommodates political and social elements also

The future evolution of the world is a subject that can, and must, give rise to numerous interpretations and exploratory approaches. Political or military, cultural or social, economic, technological or ecological analytical approaches are all legitimate, but they only form part of the whole.

In view of INTERFUTURES' position in OECD and its terms of reference, the project's approach is predominantly economic; however, a constant effort has been made to appreciate the systemic relationships between economic phenomena and the other aspects of physical or social reality.

Thus, research was done in order to assess the physical environment problems in the international context, or questions concerning the exhaustion of non-renewable resources. Bibliographical analyses were made to evaluate the prospects for essential technological breakthroughs.

But above all, in considering the way in which the world economy works, the project never lost sight of these essential elements : the national societies, the social groups which co-exist in their midst, and the governments of the Nation States which represent them politically. Only with this approach is it possible to identify the different strategies open to the various groups of developing countries, and to define the circumstances of co-operation and competition between the developed countries.

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(1) The resulting methodology is described in another document.

Similarly, from a long-term standpoint, there can be no question of postulating any invariance of values, since these will change - more or less rapidly, with a greater or lesser number of conflicts - with the evolution and composition of the relevant social groups. INTERFUTURES has endeavoured to allow for this dimension in its analyses,despite the extreme difficulty of the subject.

Lastly, the strategies of the actors involved depend very much on the way in which relations between groups and individuals are organised; hence the importance of institutions such as markets, public services, government administrations, national or transnational corporations, unions and other associations, and intergovernmental organisations. In the course of the next quarter of a century, these institutions will undergo substantial change - some will develop, others will have to contend with mounting difficulties, and still others will survive by adapting; however, some may also be changed or transformed by governments wishing to use them in order to find better answers to long-term problems.

To sum up, while INTERFUTURES is mainly concerned with future-oriented research on economic phenomena, it tries not to neglect the political struggles, social conflicts, value changes and institutional developments which are inseparable from them.

(d) Research aiming at an understanding of the problems with which OECD governments will be confronted

INTERFUTURES has sought to identify the possible courses of action open to a specific group of actors, i.e. the governments of OECD countries, which are responsible for ensuring the long-term prosperity of the societies from which they emanate. This approach has a number of implications :

- Even if the prospects for the developing countries are considered by looking first at these countries and their possible objectives, the principal aim of this research is to investigate the strategies open to the countries of the North and the impact that that they may have on the world economy.

- As to the socialist countries of Eastern Europe, the terms of reference excluded them from the scope of the analysis proper. Nevertheless, in view of the vital parts these countries are bound to play in the present and future, the team has endeavoured to produce plausible hypotheses concerning their development, in order to assess their future interrelations with the OECD countries on the one hand, and the Third World countries on the other.

. Lastly, the project gave priority to those problems which call for government action and which arise in a similar context in all the main OECD countries. It was impossible, because of lack of time, to produce a separate study for each developed country taking specific national characteristics into account.

In this framework INTERFUTURES has sought to build up a consistent and global picture, both qualitative and quantitative, of the various possible trends in the world economy, to reveal the long-term policy problems which require action from the OECD countries in the near future, and to outline certain policy proposals for consideration by the governments participating in the project.

The need for a global and long-term approach

A global and long-term approach to these problems has become necessary as a result of the interaction of two series of phenomena stemming ....

In order to clarify the way in which the findings of INTERFUTURES will be presented, it can legitimately be asked why a global and long-term approach to these problems is increasingly necessary, and what challenges the developed societies in the West are going to meet in the next quarter of a century. In other words, what is new in the history of mankind and, more especially, that of our societies?

In fact, a real transformation is taking place as a result of the interaction of two series of phenomena attributable to changes in world relations and in the situations of governments as actors.

... from changes in world relations, ...

(i) On the one hand :

. The interdependence between human societies is growing rapidly at the world level and has reached a point never previously attained: the importance of Saudi Arabian oil for the majority of national economies, the forthcoming development of "humanity's common heritage" - the oceans and the synchronisation of economic fluctuations in the developed countries are three examples among many which demonstrate this interdependence.

. Compared with natural processes, both the scale of human activities and the speed at which they are changing are increasing considerably; examples of scale are the size of the great urban centres, of tankers and fast-breeder reactors, while the rate of growth of the world population over the past fifty years illustrates the second phenomenon - speed - better than any other parameter.

. More than ever, government decisions are influencing the long-term future, often more than half a century on. For example, the present research programmes on new sources of energy can be expected to have a far-reaching influence on the composition of primary energy supplies towards the year 2025.

. But above all, unsatisfied aspirations capable of finding means of political expression are on a larger scale than in the past - already in certain developed societies, and even more so tomorrow in the developing countries.

... from the situations of governments as actors.

(ii) However, faced with these changes :

. Most governments have much more ambitious objectives than in the past, since they endeavour to provide happiness for the majority of the groups comprising the population, and to resolve all conflicts peacefully.

. Because of the variety of their responsibilities and the multiplicity of demands with which they have to contend, all governments are finding it increasingly difficult at the domestic level to achieve an adequate consensus regarding a particular policy, to co-ordinate their actions and to take the long-term consequences of their decisions into account.

. Lastly, all governments - even those of the major countries - have to contend at the international level with the considerable uncertainties resulting from the behaviour of others, future events being generated by the policies of a large number of independent governments.

What are the major questions which developed Western societies will have to face over the next 25 years?

- *Will they have to halt their economic growth as a result of physical limits imposed by the globe?*
- *How will they adapt to the pressures generated by internal changes of a social, cultural and institutional nature?*
- *How will they master the problems of their reciprocal relations?*
- *How will they meet the challenge of the Third World's development?*

The stresses caused already by these two series of phenomena will go on growing throughout the next quarter of a century. For the advanced industrial societies, those stresses are shaping up as six main issues which will determine the structure of this report.

(a) Assuming that the advanced industrial societies wish to pursue their economic growth, will they have to call a halt in the foreseeable future as a result of the physical limits imposed by the globe either on supplies of energy, raw materials, developable land and water, or on emissions of carbon dioxide, thermal waste and pollutants.

Although a number of well-known works published in recent years maintain the contrary, it does seem that this obstacle can be overcome, at least within the limits of the time-horizon influenced by our present decisions, and on condition that we implement policies which this report is seeking to define. The major problems with which our societies would have to contend would then be political, economic and social.

(b) In this respect, the first challenge is internal. How will the advanced industrial societies adapt to the pressures generated by social, cultural and institutional changes which will result in varying demands as to the composition of the social product and as to individual participation in production and decision-making? How will they overcome the value conflicts which make it particularly difficult to formulate government policies? Will they be capable of developing new values, new forms of behaviour and new institutions to meet the problems of tomorrow?

- *How will they contrive to manage coexistence with the socialist societies of Eastern Europe?*
- *How, more generally, will they be able to control growing interdependence at world level?*

(c) The second challenge will stem from the new form taken by the pressures in reciprocal relations between these societies, because of the need to reconcile co-operation and competition in such varied areas as technology, industrial activities, international trade, the monetary system and economic policy. Furthermore, the variety of responses to the internal challenge may reduce the homogeneity of the Western world, because we are no longer as certain as we were ten years ago that all Western societies are moving towards a single model.

(d) The third challenge for the advanced industrial societies of the West is that posed by the evolution of the Third World. Toynbee has stressed the importance for every civilisation - at a given stage in its history - of conflicts due to the existence of an internal and an external proletariat. In the course of the last two centuries, Western civilisation has spread throughout the whole world and has totally unsettled or transformed other societies through the economic and military power which, even more than from science and the industrial revolution, results from the effectiveness of its values. During this era, only the Japanese society has been able, thanks to the transformation undertaken during the Meiji era, to keep its cultural identity while at the same time pursuing rapid economic development. On the whole, Western civilisation has, during the last 150 years, succeeded in integrating its internal proletariat, thanks to the development of a constantly growing middle class. However, this civilisation is now confronted by the problem of its external proletariat: more than 120 countries with rapidly growing populations, already accounting for three-quarters of humanity and with standards of living very different from those of the developed countries. These societies vary enormously, but are often united by a shared historical experience which has left them with the same feeling of having suffered injustice and a desire to take part in the management of world affairs; they are themselves faced with the huge tasks of seeking a cultural and national identity, organising the State, speeding development and fighting poverty.

(e) As for the fourth challenge, this will be the continuing management of co-existence with the socialist societies of Eastern Europe. Since World War II, relations with the USSR have been the main external problem for Western societies. So far they have been able to find an answer, and the balance between the US and the USSR plays a major role in the evolution of world affairs. East-West economic relations have made remarkable progress, but the arms race is barely under control, and political clashes between East and West in the different regions of the world are becoming more frequent. East-West and North-South issues can therefore be expected to impinge increasingly on one another.

(f) The last challenge encompasses the others in great part. It is the management of growing interdependence at the world level - interdependence which multiplies the dangers of conflict between national societies while increasing the possible advantages of co-operation.

For the developed societies, all these questions are linked, and responses which are perfectly possible at the national level - or even at OECD area level - may not be feasible or desirable when the overall situation is taken into account. The fact that the issues are so closely interrelated accounts for the complexity of this report.

The plan of the report

The report is in five parts :

- *The physical limits to growth.*
- *Past trends and future dimensions.*
- *The advanced industrial societies confronted with change.*
- *The advanced industrial societies and the Third World.*
- *The management of world interdependence.*

The general pattern of this report has been dictated by the arguments set out above, except that the question of relations with the socialist societies of Eastern Europe, which is not explicitly mentioned in the terms of reference, is not dealt with separately but is incorporated in the analysis of global interdependence.

The report is in five parts :

. Without adopting any position as to the legitimacy of economic growth, Part I tackles the essential preliminary question of the physical limits to this growth.

. Whatever the importance of this problem, the next stage in the analysis must be to consider the socio-political challenges. Consequently, Part II looks at developments during the last twenty-five years from that angle and uses this review to formulate assumptions on which to build world scenarios. It indicates the few essential orders of magnitude which result from the scenarios chosen by INTERFUTURES but confines itself to those elements necessary to an understanding of the remainder of the report. It thus leads on directly to Parts III, IV and V which deal respectively with :

- the long-term prospects for the advanced industrial societies and their ability to adapt to structural changes, economically, socially, institutionally and politically,
- the relations between the advanced industrial societies and the developing societies,
- the management of global interdependence.

The report ends with conclusions summing up the main policy issues studied by INTERFUTURES with which decision-makers in developed countries will have to contend. These conclusions also emphasize the important part which can be played by all citizens of Western democracies.

The aim of this report is not to convey an optimistic or pessimistic message concerning the future, but to stimulate awareness and action.

It is not the purpose of this report to convey a pessimistic or an optimistic message concerning the future. Its aim is to stimulate an awareness of issues and action in consequence. The future we face is not foreordained. It will depend on the behaviour of the various national societies, and particularly the advanced industrial societies. If the latter react creatively, as they did after World War II, if they show themselves capable over the next few years of responding to the challenges confronting them, they will help to reduce the risks that threaten and will further the construction of a more harmonious world.

PART I: THE PHYSICAL LIMITS TO GROWTH

Will growth in population and in the world economy be halted in the relatively near future by the constraints resulting from the limited availability of the earth's natural resources or the absorptive capacities of the ecosystem?

The publication in 1972 of the Report of the Club of Rome on the "Limits to growth" stimulated a decades-old debate, one which is essential for mankind and can be summed up in a single question: will the growth in population and in the world economy be halted in the relatively near future by the constraints resulting from the limited availability of the earth's natural resources or the absorptive capacities of the ecosystem? If this were to be the case, then efforts would have to be made at once to find ways of achieving another kind of growth which would be more economical in non-renewable resources and less harmful to the physical environment.

The debate is clearly not about the existence of absolute limits to growth; since the world is finite, any geometrical extrapolation of the exchanges between mankind and the rest of the ecosystem necessarily culminates in a crisis. The problem concerns the decisions which will have to be taken in the next ten years. During that period, how is mankind to take account in its choices of the often irreversible effects its activities have on the physical, chemical, biological and ethological reality of the world? This is a difficult question, but one for which answers must be found. These will emerge progressively from an examination of demographic trends on the one hand, and prospects with regard to food, energy, raw materials and the physical environment on the other.

1. DEMOGRAPHIC PROSPECTS

Population cannot be considered, except in the medium term, as an exogenous variable. Population trends by country and by continent are possibly even more important than the world population trend.

The facts are known, but they are not always correctly interpreted, either because population forecasts are regarded as certainties, or because they are considered simply in terms of size of the world population. Before recalling the most significant figures, therefore, two major considerations should be emphasised.

. Population cannot be considered, except in the medium term, as an exogenous variable dominated by natural or biological factors (fertility, mortality) evolving independently of the transformations going on within society. It is because this elementary principle is forgotten that there is concern over the excessive use of projections of present demographic trends. History shows that there is a very close relationship between social changes and demographic trends, and it would be surprising if the ability to adjust had disappeared today when the technical possibilities for controlling fertility have improved enormously. Admittedly, the partly endogenous character of demographic change will have little influence on world population until the end of the century, but it might well alter trends in the next century decisively.

. Population trends by country and by continent are probably even more important than world population trends, since it is within national societies that the confrontation between requirements and resources first takes place, while the national demographic situations influence in turn the relations between countries. In this respect, besides the well-known divergence in economic trends between developed countries and developing countries, there is a growing differentiation between developing countries themselves. And this differentiation is already very marked where demographic trends are concerned.

Trends up to the end of the century

The world's population is likely to be about 6 billion by the end of the century; the estimates have been regularly adjusted downwards in recent years.

A few figures will give an idea of the orders of magnitude.

1. Until 1350 the world population doubled more or less every 1400 years, but since then has grown with increasing rapidity. The time taken for it to double, which was 700 years in 1650, 300 years in 1750, 140 years in 1850, 88 years in 1950, is now 35 years, which corresponds to an annual growth rate of 2%. The latest information suggests that this rate will now decline.

There is a very wide difference in trends between the developed countries and the

2. According to recent United Nations forecasts, the world population will increase from just under 4 billion in 1975 to somewhere between 5,840 million (low variant) and 6,640 million (high variant) in the year 2000 (see Table 1). It is important to note, however, that the forecasts have been regularly adjusted

Third World and among the Third World countries themselves. Some of the developing countries will experience difficulties in the medium term as a result of rapid population growth.

downwards in recent years: regional differences apart, and they are appreciable, the aggregate figure of the low variant now seems more probable, therefore, than those of the middle and high variants.

Table 1

Trend of world population
(in millions)

	1975	1980	1985	1990	1995	2000
High variant	3980	4410	4910	5440	6020	6640
Middle variant	3970	4370	4820	5280	5760	6250
Low variant	3950	4320	4700	5090	5470	5840

Source: United Nations Secretariat. Population Division, 1975

It must be remembered, moreover, that the starting figure is not reliable since the population of China alone, estimated in these forecasts at 830 million in 1975, has been calculated by various sources as between 800 and 980 million at that date.

3. The spread between the different variants in the year 2000 is very narrow for the most developed regions according to the United Nations definition (N.America, East and West Europe, USSR, Japan, Australia, New Zealand, Argentina, Chile and Uruguay): from 1310 to 1430 million. It is much wider for the developing world (excluding China): from 3430 to 3990 million, and still more for China : from 1070 to 1210 million (disregarding any error in the starting estimate)(1). In any case, notwithstanding the uncertainties, it can be reckoned that the share of the population of the present Member countries of OECD in the world population will decline from 20 to about 15% in the next quarter-century.

Moreover, in spite of similarities due to the rapid growth of their populations, important differences exist between the different developing continents owing to differences in the levels, and in possible rates of decline, in fertility and mortality.

The most recent information suggests that one should adopt low figures for North America, Eastern Asia and Europe and intermediate figures for the other regions, with the exception of Africa which might achieve high figures if rapid improvements in mortality rates were achieved (Table 2). It was the figures in Table 2 which were used in the scenarios investigated by INTERFUTURES. The 2000 horizon is too close for divergent economic trends to be reflected in appreciably different levels of population.

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(1) INTERFUTURES' own analyses on China suggest a figure of between 1130 million and 1150 million.

Table 2

World population by region (in millions)

	1975	2000	Rate of annual growth 1975-2000 in %	Index 2000/ 1975	Percentage of world population in 2000
North America	237	275	0.6	116	5
Japan	112	133	0.7	119	2
EEC	259	265	0.1	102	4.5
Other European OECD Countries	147	164	0.4	116	3
Australia and New Zealand	19	22	0.6	116	0.5
Total OECD	774	859	0.4	111	15
USSR & East Europe	363	400	0.4	110	7
Latin America	328	556	2.1	170	9
South Asia	828	1359	2.0	164	23
East & South-East Asia	337	639	2.6	190	11
China	823	1148	1.3	139	20
North Africa and Middle East	175	333	2.6	190	6
Sub-Saharan Africa	302	544	2.4	180	9
Total World	3960	5838	1.6	149	100

Source: Combination of various United Nations variants and recent projections for certain OECD countries.

4. Population growth in the least developed regions of the world during the last few decades has been due to a rapid decline in mortality coupled with stable fertility rates. At present, although fertility is still high in most of the developing countries, it is now declining in more and more cases: Taiwan, Singapore, South Korea, Sri Lanka, Tunisia, Jamaica, Mauritius, Costa Rica, Barbados, the Fiji Islands etc. are examples. Some of these countries have

experienced a 30% fall in birth rates between 1960 and 1972. As for China, in spite of the divergent estimates by experts, there are good reasons for believing that it is experiencing a significant reduction in its rate of population growth.

5. Profound changes in the relative demographic positions of the various countries will result from the growth of the Third World population. By the year 2000, 70% of the population of the Third World will be concentrated in eight countries only: China India, Indonesia, Brazil, Bangladesh, Pakistan, Nigeria, Mexico. The list of the 20 most populous countries in the world will be considerably different, Germany occupying 17th place, the United Kingdom 19th and France 20th; it will also include countries like Iran and Egypt (Table 3).

Table 3

The twenty most populous countries in 1970 and in 2000
(in millions)

1970				2000			
1. China	772	11. United Kingdom	55	1. China	1148	11. Mexico	132
2. India	543	12. Nigeria	55	2. India	1059	12. Philippines	90
3. USSR	243	13. Italy	54	3. USSR	315	13. Thailand	86
4. USA	205	14. France	51	4. USA	264	14. Vietnam	76
5. Indonesia	119	15. Mexico	50	5. Indonesia	238	15. Turkey	73
6. Japan	104	16. Vietnam	39	6. Brazil	213	16. Iran	67
7. Brazil	95	17. Philippines	38	7. Pakistan	147	17. Germany	66
8. Bangladesh	68	18. Thailand	36	8. Bangladesh	144	18. Egypt	65
9. Germany	61	19. Turkey	35	9. Nigeria	135	19. United Kingdom	63
10. Pakistan	60	20. Spain	34	10. Japan	133	20. France	62

Source: J. Vallin, "Les perspectives mondiales de population des Nations-Unies", Population, 1976.

The implications are these :

. For the developing countries, despite wide differences of situation between countries, rapid population growth has a certain number of negative consequences. It requires a high rate of investment simply to maintain the level of infrastructure per capita. It swells the labour force and depresses wages. It accelerates migration to urban areas. It makes it more difficult to combat malnutrition and poverty. It eventually produces an age structure which obliges each worker to support a large number of non-working persons.

Hence the importance for the Third World of the future impact of economic, social and psychological changes on birth rates. Development strategies oriented more towards the satisfaction of basic needs, a better distribution of income - notably through increased farm productivity - wider access to education, a change in the status of women and a continuation of family planning programmes are doubtless the factors most likely to influence demographic trends.

. For the developed countries, which have experienced a steep fall in fertility rates in recent years, the question is how these rates will move in the long term. Many demographers consider that there is a certain consensus in favour of a stationary population, but given the time it takes for demographic phenomena to work through, the possibility of wide fluctuations in fertility and even in population volume can by no means be ruled out. More specifically, in most OECD countries (especially the United States) the age structure is such that the population can be expected to rise until the end of the century (1).

Beyond the year 2000

Beyond the year 2000 the uncertainty factor increases considerably and the role of development strategies becomes crucial. A world population levelling off at around 12 billion seems a plausible hypothesis.

The uncertainty factor naturally increases considerably. According to the United Nations' projections, which assume in 2075 a world fertility equal to replacement level, the world population will reach 9 billion in 2025, 11 billion in 2050 and will then level off at around 12 billion. Of that 12 billion, more than five will be in South Asia and 2.3 in Africa, whereas North America, Europe and the USSR will together account for only just over 10% of the total. If this is what actually happens, the world population will be very much below the earth's "absolute capacity" for the human species as calculated by various authors .

Assuming that the decline in mortality rates becomes less rapid, the trend in fertility in the developing countries is, in the long term, the essential factor for the growth of the world population, but, despite the many determinants of fertility mentioned earlier, the orientation of economic policy would appear to be fundamental in any case: increased agricultural productivity, access to education, health and employment, and the redistribution of income would facilitate a more rapid decrease in fertility. The latest studies point to a gradual decline in fertility in the developing countries, but at very different rates in individual countries.

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(1) The implications for the OECD countries of their demographic trends are considered in Part III.

Some major problems

Apart from the problems specific to the developed countries or to the developing countries, the difference in demographic situations between the two groups will be a source of tension.

Thus, on the one hand, today's developed countries, in which there will be a growing tendency for public opinion and decision-makers to favour a stationary population, will move towards that state with wide fluctuations in population levels and age structures; on the other hand, the developing countries will be faced, but in conditions differing from one country to another, with all the problems of demographic growth: food requirements, very young age structures causing a high demand for infrastructures and a rapid increase in the labour supply, disorderly migration from the rural areas to the expanding metropolitan areas. (In this connection, a few figures will give some idea of the difficulties which some of the large conurbations of the Third World may experience. At the end of the century, Mexico City could have as many as 32 million inhabitants; Sao Paulo 26 million; Calcutta, Shanghai, Bombay, Peking, Seoul, 19 million; Djakarta, Cairo, Karachi, from 16 to 17 million!) (1).

These enormous differences in demographic situations between the North and part of the South may give rise to several sorts of tension :

. How will societies understand each other given that their age structures - with their well-known influence on attitudes towards the future - will be so different (35% of the population in the developing countries in the year 2000 comprising persons aged under 14 and 5% persons over 65, as against 22% and 12% respectively in the developed countries)?

. How will they settle between them the problems of migration which will be caused by differences in incomes, the huge numbers of young people arriving on the labour market in the developing countries, and the appearance of groups of political refugees as a result of the internal disorders which some of these countries will experience? The following are likely to be among the most delicate questions that governments will have to resolve: migration between Third World countries seeking to achieve ethnic homogeneity, migration from Mexico to the United States and from the shores of the Mediterranean and Africa to West Europe, political migration as a result of revolutions, and so on. For the developed countries, the choices may be particularly difficult inasmuch as the numbers of migrants, negligible in relative terms for the countries of origin, may represent significant percentages of the receiving countries' populations.

. How will they master the conflicts resulting from the great differences in per capita incomes between countries and within countries, since it will be the poorest population groups which will reproduce themselves fastest?

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(1) Naturally, the very size of these figures strengthens the probability of upheavals that would disprove the forecasts.

Rather than the prelude to an ultimate demographic catastrophe, the half-century 1975-2025 might be a phase of transition to a much slower-growing world population, but the transition will be difficult since the problems caused by rapid growth of the global population will be compounded by those resulting from the great diversity of situations as between countries.

2. FOOD PROSPECTS

The possibility of increasing world food production is central to the debate on the physical limits to growth, but the problem does not arise in a static context.

One of the basic questions in the debate on the physical limits to growth is, of course, the possibility of increasing food production. Some consider arable land resources too small and potential agricultural pollution too great for it to be possible to increase production sufficiently to meet the demand which population and income growth will have created by the end of the century. They are even more sceptical about the possibility of feeding a world population of 12 billion, especially if climatic conditions were to become less favourable in the future.

The vital issue here is mankind's ability to increase food production by developing agro-ecosystems which are resilient over the very long term. In this regard, nothing could be more mistaken than to consider the problems of nutrition in static terms and disregard the consequences of socio-political choices. The physical limits to growth of food production are not given: on the one hand, urban development and soil erosion are destroying arable land, both in the developed countries and in the developing countries; on the other, technological progress is reducing the resource requirements per unit of food output and man is able to develop methods of production that are ecologically sound.

Past developments in food production

In the last quarter-century world food production has more than doubled, but in many countries production has been short of requirements.

Over the past twenty-five years, world food production has more than doubled, and has been sufficient, at world level, to exceed average per capita requirements. But in many countries production has fallen short of requirements. In the 1950s, population growth and production were still relatively balanced in the developed countries and in the developing countries, although, in the latter, inequitable distribution of the supply caused widespread under-nutrition amongst low-income groups. However, since 1960, over-production and over-consumption have occurred in the OECD area, at national or regional level, whilst in the USSR and many developing countries (particularly in Africa and South Asia), food production has failed to keep up with population and income growth, and supply distribution in many Third World countries has become more and more uneven. These failures are due to institutional constraints rather than to resource or technological limitations.

The food deficit countries can be split up into two groups. In the larger group, which includes the USSR and most of the developing countries, food production policies have been inadequate. Expansion of the area of land devoted to food production was not complemented by the development of secondary infrastructure, and consequently feasible gains in productivity were not achieved. The second group contains those countries which, as a result of changes in comparative advantage and/or resource constraints, have deliberately reduced their degree of self-sufficiency in food. This group consists primarily of oil-producing countries in the Middle East and the newly industrialising countries. The latter, whilst still sustaining a dynamic agricultural sector, can now advantageously export manufactured goods or primary commodities to pay for food imports.

Projections of world food demand to the year 2000

In assessing the prospects for meeting food demand at the end of the century, it is necessary to work from demand projections assuming relatively high rates of population and income growth.

Cereal crops in most countries occupy 60-75% of the harvested area, and account for a very high proportion of fertiliser and energy use in food production. Although direct consumption of cereals is relatively low in the developed countries, consumption of grain-fed livestock products is high and all told, cereals provide the bulk of food energy intake. In contrast, diets in many developing countries consist largely of directly consumed cereals. It follows that projections of cereal demand are of central importance in examining physical limits to growth. Table 4 presents some estimates of grain demand in the year 2000.

Table 4 is based on relatively high assumptions for both population growth (the United Nations middle variant) and income growth (about 4% a year for the OECD countries and over 6% for the Third World countries between 1975 and 2000). The justification for these assumptions is that if resources are sufficient for high levels of demand, they will also be for lower and perhaps more probable levels. Per capita demand in each region has been calculated by reference to income elasticities based on food consumption and income figures for the period 1960-1975. As to food prices, a number of studies suggest that their average long-term level will remain stable or rise only slightly in relation to prices of other goods and services. The conditions that would have to be met for this to be so are socio-political and economic: improved infrastructures, institutional changes, increased R&D. Consequently, relatively fixed price ratios as between grain and livestock products have been assumed in the projections in Table 4.

Table 4

Projected world grain and gross per capita
food energy demand in the year 2000

	Grain demand for direct consumption (Mt)	Indirect grain demand for seed, livestock and industrial uses* (Mt)	Total grain demand (Mt)	Year 2000 demand as % of 1977 production	Gross food energy demand (Kcal/capita/day)
	(1)	(2)	(3) = (1)+(2)	(4)	(5)
OECD Europe	40				3,300
North America	23				3,300
Japan and Oceania	24				3,300
Total OECD	87	360	447	95	
USSR	51				3,300
Eastern Europe	18				3,300
Total developed countries	156	640	796	124	
China	277			210	2,900
OPEC	99			300	3,000
Other developing countries	568				2,450
Total developing countries	944	567	1,511		
Total world	1,100	1,207	2,307		

* Some regions may import livestock products rather than produce or import feed grains; consequently this demand may occur in regions exporting livestock products and not in the region indicated. Figures incorporate an estimate of grain storage loss.

All projections of this type are subject to major uncertainties regarding population and income growth. However, some general conclusions may be drawn :

. In the developed countries, the rate of growth in demand for cereals will progressively decline; most of the increase in demand will arise from income growth and will be largely for livestock feed.

In contrast, in the developing countries this rate of growth will accelerate and remain high until the end of the century. Most projections for the developing countries implicitly or explicitly assume that income growth and other redistribution measures will add only 0.5 - 1.5% to the 1.5 - 3.0% yearly increase in demand resulting from population growth. Thus the latter will be the major source of demand, although there will be wide country-to-country differences.

The OECD area, if faced by resource constraints, could meet its projected demand in the year 2000 by stopping grain exports to non-member countries, given that in 1977 the area's net grain exports represented about 15% and 18% of its production and consumption respectively, i.e. almost equal to the projected increase in its grain demand up to the year 2000. However, such an eventuality is most unlikely.

The projected situation for the developing countries is much less favourable. China would have to double and some countries treble production compared with 1977 in order to meet demand from domestic resources (Table 4, column 4). Furthermore, even given such increases, the projected average food energy intake for the non-OPEC developing market economies is insufficient to ensure adequate nutrition for the poor if wide income disparities persist (Table 4, column 5).

Physical limits to production up to the year 2000

World demand of the above-mentioned proportions will not be pressing against the physical limits to production.

World grain demand of these proportions will not be pressing against the physical limits to production, although it will be very difficult or impossible for a number of countries to meet their additional needs from currently available resources or infrastructure. In this group are Japan and several European countries, Bangladesh, Nepal, most of the countries in the Sudano-Sahelian zone, and the major oil exporters. For the remaining countries, the required rates of increase in production are not, on the whole, in excess of past performance or biological feasibility. Furthermore, most of those countries which cannot rapidly increase food production could, if necessary, provide a physiologically adequate diet from domestic resources, given an equitable distribution of the available supply together with nutrition planning.

The general conclusion that world food demand in the year 2000 will not be pressing against physical limits can be more specifically substantiated as follows :

(1) Large resources of potentially arable land exist in both the developed and the developing countries. They will only be partially utilised by the year 2000. In the longer term, the developed countries could increase their area by almost 50% and the developing countries could nearly double theirs. But there are large country-to-country differences. Japan and most European countries have little remaining land resources (although in the European countries the large area devoted to animal feed production is a

significant strategic reserve, since it could be used for the production of foodstuffs less palatable than traditional fare but of high nutritional value all the same). South Asia also has little land remaining to be developed, but could utilise its current area more frequently. Africa and Latin America, on the other hand, have very large land reserves, but most of these are subject to significant ecological constraints and technologies have yet to be developed to exploit them on a sustainable basis.

(2) The OECD countries do not have many opportunitities to expand their area under irrigation. In contrast, the developing countries, particularly the food deficit countries in South Asia and Sub-Saharan Africa, could increase their irrigated area by 50% by the end of the century, enabling them to take two or three harvests per year from the same land and to decrease yield fluctuations.

(3) Depending on the additional area brought into cultivation or under irrigation, yields will have to increase between 50 and 150% before the year 2000 if requirements of the order of those shown in Table 4 are to be met. This may prove very difficult in some developing countries, not because of physical limits but because of other resource or institutional constraints. However, the necessary increases are still well short of what is biologically possible with present technology. Grain yields in many Asian and Africa countries are currently only about one-third or one-half of those in Japan, South Korea and Taiwan and yet the soil is potentially more fertile. If, however, because of these constraints, certain developing countries were to import more of their grain or livestock product requirements, the apparent levelling-off in yields of major crops in the United States in the early seventies might be another cause for concern. But there is little evidence to support the view that this indicates a substantial break from the trend, or the imminence of biological limits to further increases in yield. The departure from trend has been caused by identifiable economic and agronomic factors. In West Europe, where food grain yields and fertilizer levels are much higher, there are no indications of an imminence of biological limits to yield increases at the farm level.

(4) Direct and indirect energy inputs to food production will have to increase substantially in the short to mid-term in both the developed and the developing countries. However, in the longer term, energy demand for the sector as a proportion of total energy demand is unlikely to reach double the current values. Since food production in the United States and the United Kingdom only accounts for about 4% of total energy consumption, energy is unlikely to be a major constraint. Increased physical demand and higher prices for energy may be partially compensated by various technological developments, although the main benefits from these are likely to occur after the year 2000: in particular (i) improvements in grassland productivity through the introduction of higher-yielding grass varieties and pasture legumes which are more

resistant to disease and less affected by seasonal weather variations, (ii) improved feed conversion ratios in the livestock sector and (iii) the development of cereal varieties which can produce at least part of their nitrogen requirements, thereby lowering their indirect energy needs in the form of nitrogen fertilizer.

(5) The mineral requirements for a major increase in fertilizer use fall short of the physical limits. Although phospate resources may be the ultimate limit, reserves are adequate for the next two centuries.

(6) Pesticide use is likely to increase by 3 - 5 times current levels. However the recent legislation concerning the registration and use of pesticides, together with the social and cost pressures which have led to greater research on and use of integrated pest control, biopesticides and biological control, are likely to contain pesticide pollution. Emissions should generally be within the absorptive capacity of the ecosystem except in limited areas where, through bad management or by accident, tolerance levels will be exceeded.

Beyond the year 2000

Beyond the year 2000 the food outlook is much more uncertain, but there are two conceivable ways in which an additional increase in food production could be achieved :

- *the first is in conventional agriculture, where technological developments might contribute significantly to the ability to sustain a population of 12 billion;*
- *the second is in the industrial application of biological technologies so as to supplement agricultural production.*
- *Furthermore, conservation of productive*

After the year 2000, growth of food demand will be almost entirely concentrated in the developing countries. At the beginning of the 21st century Africa and Latin America will still have significant land resources to develop. Together with South Asia, they will also have some opportunities for extending the area under irrigation and average yields in 2000 will still be below what is biologically possible.

Keeping to the hypothesis of a world population stabilised at about 12 billion in the year 2075, and assuming that diets in the developing countries approximate the traditional diets of their middle-income groups, the resource base should be adequate to sustain that population. However, income growth in the developing countries after the year 2000 could create a large demand for livestock products. If this reached the qualitative and quantitative levels currently prevailing in OECD countries, the implied expansion in feed grain production might be very difficult to achieve, on the basis of current knowledge of the long-term development potential in conventional agriculture. In the event of unfavourable climatic changes (1) and continued loss of arable land through soil erosion and urban development, it might even be impossible to sustain such a diet for 12 billion people for any length of time.

There are two conceivable ways in which an incremental increase in food production could be achieved :

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(1) See Section 5 of Part I.

soil is important in order to preserve long-term agricultural production potential.

- The first is in conventional agriculture. Dutch scientists have estimated that the long-term absolute maximum for world grain production is some thirty times the level at present. Achieving this would mean developing at very high cost (of the order of $US 10,000 per hectare) all the areas with soils and climates suitable for agriculture, and applying fertilizer and other inputs up to the level at which the physical laws governing photosynthesis and the accumulation of carbohydrates in grain crops place a biological ceiling on further increases in output. But in fact there is some doubt as to whether it is possible to develop suitable agro-ecosystems for certain areas, and if so, whether those areas can be used for grain production. Furthermore it may prove difficult to increase average yields to more than 50% of the theoretical maximum. Nonetheless, technological developments in conventional agriculture could contribute significantly to the ability to sustain a population of 12 billion.

- The second possibility is the industrial application of biological technologies so as to supplement conventional agriculture. For example, advanced fermentation technology may provide the basis for industrial production of a wide range of non-conventional foods independent of the farm sector. Many of these products are likely to be more expensive than conventional ones and hence beyond the purchasing power of the poor in developing countries. Moreover, they are unlikely to be readily accepted by consumers (initially, at any rate) for reasons of taste or appearance, particularly if they are marketed in a semi-processed form. They will probably require more process energy than conventional foods. However, if a sustainable energy system is evolved, such products will be less constrained by physical limits to production than conventional foodstuffs.

In any case, preservation of the long-term possibilities for developing agricultural production will depend on the conservation of productive soil.

But with the increase in world population and in the scale of economic activities, conflicts between the various modes of land use are becoming increasingly intense in certain regions of the world. The chief competing purposes are residential, industrial, commercial and recreational uses, transportation, mining and mineral extraction, preservation of the natural habitat, and agricultural, pastoral and forestry uses.

Loss of productive soil is one of the most pressing and difficult problems facing the future of mankind. The problem has several aspects :

- deforestation in the tropical regions with a risk of increasing the concentration of carbon dioxide in the atmosphere (according to some estimates, the destruction of the Amazon forest could increase the concentration by 10%), increased erosion and sedimentation affecting fresh water and the adjoining seas, possibilities of climatic changes in the long term in the inter-tropical zone;

. erosion, both in the developing and in some developed countries like the USA (thus, for the Third World as a whole, annual soil loss through desertification has been estimated at 0.3% of the total land area; 20% of land in Bangladesh and 80% of land in Madagascar is seriously affected by erosion, 77% of land in El Salvador is suffering from accelerated erosion, and according to UNDP, "the principal problem" of Haiti is "rapid and increasing erosion"; as for the United States, it may have lost, according to current estimates, 30% of the topsoil in the course of the last 200 years), with the twofold consequence of a reduction in crop yields (all other things being equal, of course) and an intensification of energy use for agricultural purposes;

. increase in the salinity and alkalinity of the soil from irrigated agriculture which causes a total annual loss of between 200,000 and 300,000 hectares of irrigated land, and for the Third World alone an annual loss of 0.2% of the irrigated area;

. urbanisation, which results, for example, in annual losses of between 0.1 and 0.8% in the OECD countries (25,000 hectares in Japan and 1 million in the United States), but which, bearing in mind demographic trends, will be particularly important in the long term for the developing countries; thus, in Egypt, the total irrigated area has virtually remained the same during the past two decades in spite of the thousands of hectares of new irrigated land developed due to the construction of the Aswan Dam - furthermore, the land lost was good, arable land.

These various factors have slowed down the growth of agricultural production.

For the countries concerned by the loss of productive soil, it will make more sense to prevent further soil loss by adopting better management policies than to let the soil deteriorate and then to take remedial measures that are costly,in both economic and environmental terms, or to develop additional land requiring heavy investment.

The issues

Three questions should be considered by governments :

- protection of productive soil;

- development of ecologically sound and sustainable agricultural technologies that would

Three questions concerning the physical limits to food production should be considered by governments :

(1) Soil loss through erosion and urbanisation is already a problem in the developing countries; the governments concerned should take immediate steps to introduce adequate policies to prevent such loss and assistance from the developed countries would be highly desirable.

In view of the risk of unfavourable climatic change, the developed countries should take steps to strengthen their current soil conservation policies, even if soil and land losses appear relatively small at present. They must ensure that all arable land resources remain available to the agricultural sector, although not necessarily in use.

make it possible to farm much of the potentially arable land in the Third World;

(2) Ecologically sound and sustainable agricultural technologies have yet to be developed for many of the areas of potentially arable land in the Third World. The OECD countries could play a positive role in assisting the developing countries to accomplish this task.

- removal of physical limits at local level.

(3) The absence of physical limits at world level in the circumstances described does not mean that there are not physical limits at the local level :

. In some developing countries the population is already coming up against physical limits, either because smallholders and landless labourers are denied access to insufficiently farmed land - sometimes in defiance of existing legislation - or because farmers are prevented from using yield-promoting technologies by infrastructural or institutional constraints. Suitable aid policies can contribute to the removal of these constraints, but the outcome will largely depend on a reorientation of domestic policies by the governments concerned.

. Elsewhere, but particularly in Africa and areas of Latin America, farmers have access to the potentially arable land and can, should they so wish, clear it manually with simple tools; there are no capital or institutional constraints in such areas. The same is true of certain irrigation projects. What is needed here is to develop food-for-work programmes. But international institutions and their field consultants unfortunately have little experience in directing such schemes.

. Finally, there are the irrigation and reclamation projects requiring capital investment beyond the current means of the governments concerned. Their implementation will depend largely on direct or indirect financial flows from the OECD countries. However, it must not be forgotten that it takes 10 to 15 years to reap the benefits of capital-intensive development projects, whereas certain temporary biological limits to yield increases can be removed within five years, given the necessary institutional and infrastructural improvements.

. In any case, the OECD countries could do a great deal to help remove these local limits, both by increasing the volume of their financial aid to agriculture and by working to change the way in which that aid is used (1).

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(1) More generally, their own agricultural policy influences agricultural development prospects in the Third World, but this question will be dealt with in Part IV of the report.

3. ENERGY

As regards energy, the analysis of available resources, assessment of future consumption, identification of constraints, and description of options and strategies make it possible to draw three main conclusions :

- *Resources should be sufficient to meet long-term demand.*
- *The length of the period of transition from the present energy systems will be of the order of a half-century at least.*
- *Serious crises of various types may arise throughout that period.*

No subject has been studied more intensively than energy since 1973. In spite of the uncertainties which remain and which will not be easily dispelled, three essential findings have emerged.

. Energy resources should be sufficient to meet in the long-term, and on a regular supply basis, world consumption levels which will be 10 to 15 times higher than that of 1975, at costs which over the period are not more than twice or three times as high as production costs in 1978.

. But the energy system is very slow-changing and the length of the period of transition from the present oil-based energy system to the energy systems of the future will no doubt be of the order of a half century at least.

. This transitional period is marked by great uncertainties arising from the trend in consumption, the level of investment in the energy field, the state of resources and the world political situation. Because of the system's slow-changing nature, if adequate strategies are not adopted, regardless of whether they may seem pointless in the short term, various types of crises with serious consequences may emerge in the next twenty-five years.

These conclusions stem from an analysis of available resources, an assessment of future consumption, an identification of the constraints imposed on the energy system by the other parts of the social system, and lastly from a description of possible options and strategies. Naturally, energy problems are not confined to the question of physical limits to growth. They will crop up in other contexts throughout this report.

Resources

The figures for energy resources are very uncertain, but non-traditional fossil fuel resources, nuclear fission with breeder reactors, fusion and solar energy account for very large amounts.

Figures for proven reserves are not appropriate for the purpose of studying long-term growth. It is the volume of resources which must be taken into account, even if that quantity is extremely uncertain both as regards the existence of these resources and as regards extraction costs. To assess this volume, it is useful to refer to three figures for world consumption :

- that for 1974 : 5.6 MMTOE (1),
- one of the many estimates made for the year 2000 : 15 MMTOE,

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(1) 1 MMTOE = 1 billion tonnes oil equivalent

1 Q = 10^{18} BTU which is approximately the equivalent of 25 MMTOE.

- the estimate made by the Hudson Institute in an optimistic growth scenario of the cumulative total of world consumption from 1975 to 2176 : 10,000 MMTOE or 400 Q.

Let us consider each of the primary energy sources in turn :

. One of the most recent studies in oil resources is that of the World Energy conference (Istanbul 1977). Limiting production costs to US$ 20 per barrel in the year 2000 (excluding taxes and profits), and assuming an improvement of 25 to 40% in recovery rates, experts' estimates range from 173 to 750 MMTOE, two-thirds of them being within the range 225 and 300 MMTOE. The IIASA (1) chose the figure of 300 MMTOE in its study on energy. As for production, the most plausible figures indicate that a maximum of 5 to 6 MMTOE per year would be reached between 1990 and 2000, with a decline thereafter to 2.5 MMTOE per year by 2020. There would then remain 120-130 MMTOE to be consumed.

. For natural gas, the probable bracket of resources is from 200 to 500 MMTOE, the World Energy Conference having estimated the resources remaining to be produced in the world in 1976 at 280,000 billion cubic metres. Production will certainly increase considerably up to the beginning of the 21st century, but might remain stationary during the next decade because of the present state of exploration. It will certainly reach its peak (of the order of 4,000 billion cubic metres per year) well after the peak period for oil production, perhaps two or three decades later.

. Coal, on the other hand, is relatively abundant. The World Energy Conference put resources at 6,750 MMTOE, reserves technically and economically recoverable at present being estimated at 430 MMTOE. Annual production might rise to 5.8 MMTOE according to the Conference, and to 8 MMTOE according to the IIASA in the next century.

. Besides these three classical sources there are resources of various origins; non-traditional oil resources (300 MMTOE of heavy crudes and tar sands have been identified in Canada, Venezuela, USSR and USA; there are 420 MMTOE of bituminous shales, of which two-thirds in North America; for these resources extraction costs would be between 1976 US$ 12 and 25 per barrel); non-traditional gas resources (Antarctic gas, natural gas contained in geological zones under pressure, frozen natural gas in the Arctic; these resources are difficult to evaluate, but seem to be quite considerable).

. Finally, as regards nuclear energy, reserves of low-cost uranium and thorium are limited and would only provide 100 MMTOE without breeder reactors.

It is obvious, therefore, that the sources examined so far cannot provide a very long-term solution, but the orders of magnitude change when new forms of energy are considered.

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(1) International Institute for Applied Systems Analysis, Laxenburg (Austria).

. With the emergence of breeder reactors, 125 x 10^6 MMTOE could be obtained by fission from the reserves of uranium and thorium in the event that the reactors were burning expensive fuels. H. Kahn (1976) gets a much lower figure of the order of 10 x 10^6 MMTOE by keeping to the fuels at present being considered.

. We shall probably not be absolutely certain of being able to master nuclear fusion technically and economically before the end of the century. But, according to the IIASA, the resources available for D-T (lithium) and D-D reactors are such that the energy derived from the fusion process could be as much as 250 x 10^6 MMTOE. H. Kahn (1976) estimates the corresponding possibilities at 8 x 10^3 MMTOE and 25 x 10^6 MMTOE respectively.

. As for solar energy, which is mentioned here purely in terms of resource potential, its contribution to energy supply must be evaluated in the form of a flow. The surface of the earth receives each year energy equivalent to 100,000 MMTOE. The natural cycle of water absorbs one-third of this; one-third of one per cent actuates the wind and the ocean waves; the volume of solar energy necessary for the perpetuation of life by the process of biosynthesis is negligible in comparison with the other volumes; all the remainder is absorbed by the planet or reflected into space.

. Many other renewable sources of energy derive naturally from solar energy: hydro-electricity, which represents globally, according to the World Conference on Energy, an annual resource of 9 MMTOE; tidal energy, of which the order of magnitude is very small (50 MTOE per year); wind energy, for which applications could be found for domestic usage in isolated regions; wave energy, the exploitation of which poses formidable technical and economic problems, and finally wood and organic wastes. Nowadays, of course, wood fuel only covers 6% of the total consumption of energy, but the proportion is as high as 28% in the developing countries and it is also possible to transform into methane or ethanol both primary agricultural products (sugar cane, sugar beet, seaweed, etc.), and agricultural wastes containing cellulose.

. As for world geothermal resources, these - still according to the IIASA - might be as much as 125,000 MMTOE, but the economic conditions for exploitation virtually rob this figure of any practical value.

But, apart from solar energy, the contributions from other renewable energies should not be over-estimated. To give an idea of the orders of magnitude of outputs which might be obtained (solar energy excluded), Table 5 tests the indications given by the IIASA concerning the potential annual outputs which could be achieved by about 2030.

Table 5

Potential annual production of renewable energy sources
(excluding solar energy) in MMTOE

	Technical Potential	Achievable Potential
Forests and fuel farms	5.7	1.9
Organic Wastes	0.1	0.1
Hydro-electricity	2.3	1.1
Glaciers	0.1	-
Winds	2.3	0.7
Geothermal energy	0.3	0.2
Thermal energy from the sea	0.7	0-0.7
Tides	0.03	-
Total		4.0-4.7

Source: IIASA, 1978.

By way of recapitulation of energy resources, Table 6 gives the figures put forward by H. Kahn in his book "The next 200 years". These figures tally, in orders of magnitude, except as regards commercial feasibility, with those provided by other sources (1).

Thus, in the long term, world production of energy will not be limited in any way by the volume of resources: future energy systems may be mainly based on nuclear energy (fission reactors of the breeder type or fusion reactors) and on solar energy. Once these systems are established, energy costs should not tend to increase. Since the annual production of oil will decline no doubt by the end of the century at the latest, mankind is faced with a transition during which it can use, pending the arrival of new forms of energy, the other fossil fuels (in particular coal) and nuclear fission.

Superimposed on the problem of transition there is a geopolitical interplay resulting from the

This optimistic statement of the position should not cause us to forget the considerable problems posed by the decline of oil, which provided 49% of the world consumption of primary energy in 1974, problems due in particular to the uneven geographical distribution of resources:

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(1) The only discordant figure is that for lithium, the estimate probably being based on known reserves; as lithium has never really been properly prospected, the probable resources are no doubt much larger and the order of magnitude might be 1,000,000 Qe.

Table 6

Global Energy Resources

	Long-Term Potential (Est.)	1st Commercial Feasibility (Est.)	Problem Areas a/
Hydro-electric	.1 Qe/yr	Current	C
Oil and Natural Gas	30 Q	Current	E
Tar Sands and Oil Shale	30-2,000 Q	1985	C,E
Coal and Lignite	200 Q	Current	E
U-235 (Free World)	15 Qe	Current	E
U-235 (Ocean)	3,000 Q2	Current	C,E
Uranium for Breeders	>100,000 Qe	1995	C,E
Li-6 (D-T Fusion Reactor) b/	320 Q	1995-2005	C,E,T
Deuterium (D-D Fusion Reactor)	>1 billion Q	2020-50	C,E,T
Solar Radiation (1% of Surface Energy)	30 Q/yr	1980-2000	C,T
Ocean Gradients	20 Qe/yr	2000	C,T
Organic Conversion	1.2 Q/yr	1975-90	C
Geothermal - Magma	>1 billion Q	?	C,E,T
Hot Dry Rock	>100,000 Qe	1990-95	C,E,T
Liquid-dominated	>1,000 Qe	1980-85	C,E
Dry Steam	1 Qe	Current	-

a/ C = cost, E = environment, T = technology.

b/ Li-6: The lithium isotope used to breed tritium in first-generation fusion reactors. World resources might be 10 times greater than shown.

1 Qe = 1 Q of electrical energy = 10^{18} BTU of electrical energy.

Source: H. Kahn "The next 200 years", 1976.

differences in resources possessed by the various countries during the period of adjustment.

. As regards oil, the present OPEC countries hold about 70% of proven resources, and, with the other developing countries, 60% of total resources; the OECD countries only possess 10% of proven reserves (of which practically none in Japan and less than 2% in Europe) and 17% of total resources (of which the bulk is in North America); as for the European socialist countries, they possess from 16 to 19% of total resources, but this is concentrated in the USSR.

. Three countries (the USSR, the United States and China) possess 90% of world reserves of coal; four others (the German Federal Republic, the United Kingdom, Australia and Canada) have 7%; eight others (among them India, Poland, South Africa, the German Democratic Republic, Czechoslovakia and Mexico) share 2.8% between them.

Overall, from the point of view of resources, North America is in a favourable position, Japan in a very bad position, while the situation in Western Europe is slightly better. The USSR has abundant resources. As for the positions of the various developing countries, they vary considerably, South-East Asia having few resources, China, Latin America and tropical Africa being in an average position.

The data on the geographic distribution of reserves must nevertheless be treated with some caution, since uncertainty as to ultimate resources increases at regional level. Tables 7 and 8 nevertheless give some idea of these.

Table 7

Fuel supplies by regions (MMTOE)

Region	Ultimately recoverable resources of coal, oil, natural gas	Uranium and Thorium	
		Thermal	Breeders (4)
North America	1110 - 1940	46	2760
Western Europe	116 - 270 (1)	7.6	460
Japan	4 - 6	negl.	4
East Europe and USSR	2500 - 3470 (1)	?	?
Latin America	54 - 480	1.6	100
Middle East	61 - 610	7.6	460
Rest of Africa	58 - 480 (2)		
China	289 - 470 (3)	?	?
Other South-East Asian Countries	43 - 225 (3)	1.1	68

(1) For natural gas, total for all Europe
(2) For coal, total in Africa other than Middle East
(3) For natural gas, total in China and other South-East Asian countries
(4) Solely for fuels at present being considered.

Source: Chesshire and Pavitt

Table 8

Fossil fuel resources
(in MMTOE except for uranium)

Cost categories (1) / Region	Coal (2)		Oil			Gas			Uranium (10^3tU)	
	I	II	I	II	III	I	II	III	I	II
North America	133	178	18	20	96	26	30	22	1920	1500
USSR and Eastern Europe	106	348	29	35	53	47	36	22	n.d.	4140
Western Europe, Japan, Australia, New Zealand South Africa & Israel	71	116	13	2	16	14	4	10	793	2087
Latin America	8	8	14	62	77	13	9	10	56	3544
Africa (excepting North Africa and South Africa) and South and South-East Asia	42	40	19	4	25	12	8	10	311	5269
Middle East and North Africa	0	1	101	20	n.d.	83	8	10	78	1524
China and centrally planned Asia	70	96	8	10	11	5	9	10	n.d.	1980
World	430	787	202	153	278	200	104	94	3158	20044

(1) Cost categories indicate in 1976 dollars the maximum cost of recovery of the corresponding resources :

For coal
I = 25 US$ (1976) per ton of coal
II = 25 - 50 US$ (1976) per ton of coal

For oil and gas
I = 12 US$ (1976) per barrel of oil equivalent
II = 12 - 20 US$ (1976) per barrel of oil equivalent
III = 20 - 25 US$ (1976) per barrel of oil equivalent

For uranium
I = 80 US$ (1976) per kg. of uranium
II = 80 - 130 US$ (1976) per kg. of uranium

(2) For coal part only (about 15%) of ultimate resources have been included, since there is too much uncertainty about long-term resources and production techniques.

Source: IIASA, 1978

Thus, in the field of energy, superimposed on a problem of economic transition there is a geopolitical interplay resulting from the differences in resources possessed by the various countries during the period of adjustment.

Future consumption

Because of the levels and structures of GNPs in the developed countries, their energy consumption will increase more slowly in future, even if their growth rates are maintained.

Energy resources are meaningful only when related to demand, but it is particularly difficult to make precise assessments of long-term trends in energy consumption since on the one hand, for a given GNP, demand depends on the availability of resources (that is to say the price of energy) and on the composition of total production (that is to say mainly the lifestyle) and on the other hand, the future growth of GNPs is uncertain and partly conditioned by the availability of energy.

On the other hand, because of their industrialisation requirements and their population growth, developing countries' energy demand will increase steeply.

We will confine ourselves for the moment to a few basic facts which must be taken into account in any projection :

. From 1900 to 1974, world consumption of commercial energy increased by almost 11 times: 508 MTOE in 1900, 1667 in 1950, 5600 in 1974. Already during the last quarter-century there have been enormous differences in growth as between groups of countries: 157% in non-Communist developed countries, 395% in the planned economy countries, 441% in the non-Communist developing countries.

World consumption of something between 12 and 15.5 MMTOE per year by 2000 seems likely. For the longer term, estimates become much more uncertain.

. Annual per capita world consumption of commercial energy is at present of the order of 1.4 TOE, but it varies considerably from one area to another: 8.1 TOE in North America, 3.8 in Eastern Europe, 3.2 in Japan and 0.23 in the developing countries.

. The ratio of energy consumption to GNP and the elasticity of energy consumption in relation to GNP both decline with the level of GNP per capita even though considerable differences remain between countries for the same level of per capita income. In particular, elasticity is considerably higher than unity for the developing countries (from 1.3 to 1.5 according to the authors), but well below unity (from 0.7 to 0.8) for the developed countries.

. As for the influence of price, the most recent studies suggest that the long-term price elasticity of energy consumption is far from negligible in developed countries and that a significant reduction in energy consumption could be obtained (up to 40% in the United States) with a small relative decline in national income, of the order of a very few per cent (but the absolute value of this decline would be considerable) on condition that the trend were gradual and steady and made it possible to adjust capital equipment. On the other hand, sudden and steep changes in prices cause much greater reductions in GNPs. (Hitch, 1977).

All in all :

Because of the levels and structures of the GNPs of the developed countries, their consumption of energy will increase more slowly in future, even if their rates of growth are maintained. Moreover, energy prices can have a considerable influence on the life-style of these societies, since GNPs of roughly the same level can be achieved with considerably lower energy consumption if the changes are planned long enough in advance and if the necessary investment in capital equipment is carried out. On the other hand, because of their industrialisation requirements and their demographic growth, the developing countries' demand for energy will increase steeply. In their case, the availability and cost of energy will have a more decisive influence on growth possibilities.

In terms of orders of magnitude, the analyses carried out by INTERFUTURES are similar to those of many other studies, and reach the conclusion that at the end of the century, world consumtion will be somewhere between 12 and 15.5 MMTOE, depending on the assumptions made about economic growth.

Table 9 compares four estimates: two taken from the "Workshop on Alternative Energy Strategies (WAES)", scenario C2 (high growth, rising energy prices, vigorous reaction by governments, nuclear energy as the main replacement fuel) and scenario D7 (low growth, constant energy prices, vigorous reaction by governments, nuclear energy as the main replacement fuel); two taken from INTERFUTURES, scenario A for high growth (with vigorous conservation policies) and scenario B2, one of the moderate growth scenarios.

Table 9

World consumption of energy in the year 2000
(in MMTOE)

Scenario / Region	WAES D7	INTER-FUTURES B2	WAES C2	INTER-FUTURES A
North America		2.9		3.2
OECD Europe		2.1		2.5
OECD Pacific		1.0		1.2
OECD	6.37	6.0	8.06	7.0
USSR & Eastern Europe	(3.00)	3.0	(3.10)	3.1
OPEC Other developing countries	1.78	2.3	2.48	2.7
China	(1.80)	1.8	(1.80)	1.8
Total developed countries	(9.37)	9.0	(11.16)	10.1
Total developing countries	(3.58)	4.1	(4.28)	4.5
Total World	(12.95)	13.1	(15.44)	14.6

Source: WAES and INTERFUTURES

The WAES scenarios do not give estimates for the communist countries. To obtain world consumption based on those scenarios, therefore, the figures of the nearest INTERFUTURES scenario for those countries have been added. The resulting estimates are given between brackets.

Moreover, an International Energy Agency estimate for the year 2000 leads, for a relatively modest growth in the Third World (China excluded) from 1985 to 2000 (6% per year for the OPEC countries, 4.7% per year for the others), to a consumption of 1900 MTOE for the non-OPEC and 700 MTOE for OPEC, i.e. a total of 2600 MTOE, which is consistent with INTERFUTURES' estimates.

Thus, from 1976 to 2000, consumption will double approximately for the OECD area; but, for the developing countries, it will increase by a factor of between five and seven. Nevertheless, an inhabitant of the developed countries of the East or of the West will still consume seven times more commercial energy than an inhabitant of the developing countries.

It is much more difficult to estimate what the energy consumption will be in the very long term for a population of 12 billion. Thus, IIASA has studied up to horizon 2030 for a population of 8 billion two scenarios giving respectively consumptions of 20 MMTOE and 32 MMTOE. Assuming that the world aligns itself on average with the per capita consumption of Japan in 1974, a world population of 12 billion would in the long term consume 40 MMTOE of energy. But with such horizons the concept of elasticity no longer has much meaning, since the composition of the national product will change fundamentally in the present developed countries, while in the Third World the form of industrialisation will be profoundly influenced by the new technologies, in particular electronics and bio-industry.

Before making a meaningful comparison between resources and demands, allowance must be made for the constraints which are likely to limit the development of the energy system.

The constraints

Five constraints limit the possible development of the energy production and distribution systems :

- *the lack of flexibility of the supply-demand*

Five major constraints will combine to limit the possible development of the energy production and distribution systems:

(i) because of the size and complexity of the energy systems, the patterns of the supply-demand balances for primary energy can change only slowly. Historically, it has always taken 50 to 100 years for a primary energy source to conquer 50% of the world market. The same observation can now be made as regards the development of nuclear energy. This being so :

balances for primary energy;

- *the impact on the climate;*
- *the influence on the environment;*
- *problems of safety and of nuclear proliferation;*
- *the investment of massive amounts of capital.*

. It is the decisions taken before 1985 which will be of crucial importance for the development of the energy situation during the first quarter of the next century (1).

. Energy sources whose development is still at the research and development stage will not play any major role before the twenty-first century.

. Consequently, the only three possible decisions which can have any major influence on the energy situation between 1990 and 2000 are to implement energy savings policies, to develop nuclear energy, to increase coal production. On the other hand, it is necessary to begin immediately preparations for the implementation of new energies policies.

(ii) The impact of the energy systems on the climate due to emissions of carbon dioxide and the dispersion of thermal wastes, may in time limit the use of fossil fuels or make it essential to locate at precise points the large primary energy processing units. This is one of the most important aspects of the world physical environment problems discussed below, but the general consensus of a recent seminar held by the IIASA and of a World Meteorological Office meeting in February 1979, was that the problem is of immediate concern but the current evidence is too inconclusive to justify taking account of it in present energy policies.

(iii) Future energy production techniques will involve the use of enormous areas of land and very large volumes of materials and water, whence the problems concerning local environments. For example, will the ecological costs of the large-scale extraction of solid fuels be accepted in the advanced industrial societies either for national consumption, or for export? The second part of this question concerns, within the OECD area, countries like the United States, Canada and Australia. If the reply were to be partly negative, Western Europe and Japan could have great difficulties in coping with oil crises.

(iv) The development of nuclear energy has come up against two distinct problems: that of proliferation, which is at present being studied in depth in the large developed countries, and that of technical safety (risk of contamination of the personnel of power stations, risk of contamination of an extensive region by radio-activity in cases of serious accident or sabotage, the elimination of wastes which remain radio-active over long periods). These risks should be balanced against those inherent in the large-scale use of solid fuels: deaths by accidents or illness in coalmines, influence of the carbon dioxide content of the atmosphere, etc. In this connection, the advanced industrial societies are faced with two questions :

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(1) For example, many American studies show that it is after the year 2000 that the effect of a nuclear moratorium will show on a large scale.

- What technico-political process should be used to fix safety standards that would be accepted by the population, since neither the technicians nor the politicians are in a position to take sole responsibility for this?

- How are energy policies which are consistent in the long-term to be adopted if there is a slowdown in nuclear programmes under pressure from local communities or sections of public opinion?

As for the problem of proliferation, its strategic and political dimensions take it outside the field of energy supply. But the nature of the problem is such that it could hold back the growth of installed nuclear power, particularly in the developing countries.

(v) Both because of their intrinsic characteristics and the need to limit their impact on the environment, most of the future sources of primary energy will involve the investment of massive amounts of capital (oil extraction from the ocean beds and tertiary recovery oil; nuclear energy; coal mined by new techniques; oil from shale; solar energy when R&D costs are included). According to IIASA estimates the same applies to the development of energy savings. We shall therefore see a gradual increase in the proportion of total investment allocated to the production, distribution, or saving of energy. This could give rise to a real problem for the developing countries (cf. Part IV). Depending on their stage of advancement and their policy for development, these countries will also have to resolve, in varying proportions, the following two problems: how to satisfy, first, the low-density-per km^2 energy demand of the rural areas (the scarcity of wood fuel which the countries of the Sahel are at present experiencing is an example of this) - this demand could be met by particular techniques (biomass), some of which are not capital-intensive - and second, the high-density energy demand of urban population centres and sectors in the process of industrialisation which involves the same highly capital-intensive techniques as are employed in the developed countries.

Together, these five constraints strongly influence the shape of possible energy strategies.

Options and strategies for dealing with energy crises

Three types of uncertainties affect the future development of available supplies of oil.

To deal with these, government policies are necessary on a national and on an international scale.

Three types of uncertainties, too often confused, affect the future development of available supplies of oil :

- political crisis, with sudden and no doubt temporary restrictions of deliveries as a result of tensions, wars, revolutions;

- capacity crisis due to the lack of sufficient investment by the OPEC countries, which may consider that it is not in their interest to increase extraction rates even where resources would permit it; many experts and the International Energy Agency in particular fear that this kind of crisis may emerge round about 1985;

- resources crisis due to the difficulty of increasing oil production in the light of the state of known reserves and estimated resources. As we have seen it is this kind of crisis which might begin to emerge in the last decade of the century, if government policies turn out to be insufficient.

Except for the first kind of crisis, which involves either the introduction of oil allocation systems or foreign policy action, the other crises involve three kinds of action by governments:

. Action on a national scale, for the transition period, which would simultaneously concern energy savings, the development of nuclear energy and the framing of policies for coal.

. Action on an international scale,for the period of transition which is necessary because of the differences in situations between countries. This relates to well-known questions - extraction and pricing policies by the OPEC countries, developed countries' policies in regard to investment of oil surpluses, access for Europe and Japan to the coal of the other OECD countries, aid from the developed countries to the developing countries outside OPEC so that they can develop their own resources.

Such action must have as its goal to prevent the triggering of a new inflationary recession in the last 15 years of the century due to a shortage of oil, an increase in its prices, the emergence of further oil surpluses, balance of payments disequilibria, a fall in the economic activity levels of the consumer countries (cf. Part III).

. National and international action having longer term objectives concerning the development of new primary energy sources, storage and transport of energy and conversion of secondary energy, and the long-term requirements for a liquid or gaseous energy source after the exhaustion of oil or natural gas...

To make it easier to appreciate the scale of the actions required, some data about the volume of supply by region and by source in the year 2000, the differences between desired imports and potential exports, future energy prices, and investment requirements may be useful.

To give some idea of the scale of the government action required, several orders of magnitude must be recalled :

- primary energy supply volumes by region and by source towards the end of the century and beyond;
- the gaps which will exist in the year 2000 between imports desired by the main importers and potential exports ;
- the real price of energy which may result at the end of the century from the balance between supply and demand;
- the volumes of investment which seem necessary to cope with the demand for energy.

(i) By way of illustration, Table 10 gives an outline of energy supply in the year 2000 in the framework of the INTERFUTURES' high-growth scenario (scenario A). It compares the percentages obtained on a world scale for the various energy forms with those obtained by IIASA in the two scenarios studied by that Institute.

In spite of some differences, these figures clearly show the probable percentage ranges within which the various energy forms will come and the preponderant role which fossil energies will still play at that time.

But the biggest energy changes will occur beyond the end of the century. In all likelihood coal consumption will increase considerably, in particular to meet the demand for synthetic liquid fuels, nuclear energy will cover an increasing proportion of electricity requirements; solar energy will gradually develop.

Table 10

Energy supply in the year 2000
(in MTOE)

INTERFUTURES Scenario A Regions	Coal	Oil	Natural gas	Hydro-electricity	Nuclear	Others	Total
OECD Europe North America Japan and Pacific	250 750 130	1045 1205 670	420 450 120	100 175 40	625 650 170	100 100 30	2540 3300 1160
Total OECD	1130	2920	990	315	1415	230	7000
USSR Eastern Europe	580 360	755 240	640 130	95 15	185 40	45 15	2300 800
Developed countries	2070	3915	1760	425	1640	290	10100
China OPEC and other LDCs	950 270	555 1490	105 440	50 300	75 140	45 80	1780 2720
Developing countries	1220	2045	545	350	215	125	4500
Total World	3290	5960	2305	775	1855	415	14600
Shares of the various energies	22 %	41 %	16 %	5 %	13 %	3 %	100 %
IIASA High growth scenario							
Total World	3610	5230	2150	420	2640	350	14400
Shares of the various energies	25 %	36 %	15 %	3 %	18 %	3 %	100 %
Low growth scenario							
Total World	2915	4025	1610	410	2100	290	11350
Share of the various energies	26 %	35 %	14 %	4 %	18 %	3 %	100 %

Source: IIASA, 1978 and INTERFUTURES

(ii) But the matching of supply and demand by source of energy may run into difficulties not only because of differences of levels but also because of differences in the patterns of supply by source and desired demand by source. In this connection Table 11 clearly brings out the problems of the transition period by comparing the imports desired by the main importers and potential exports. It corresponds to the WAES scenario C2, which forecasts oil production of the order of 5200 MTOE. Apart from differences concerning the nature of the fuel, there is a shortfall of one billion tons between desired imports and potential exports, and this is assuming vigorous economic policies and a considerable development of nuclear energy. The shortfall would be reduced to 600 MTOE in the WAES D7 low-growth scenario. These figures show the size of the gap that has to be bridged.

Care must be taken in interpreting this table, however. It is not clear that it takes fully into account the possibilities of Mexican exports. And, as regards coal, the International Energy Agency puts at 136 MTOE and 63 MTOE possible exports from Australia and South Africa respectively.

Table 11

Differences between desired imports and potential exports in the year 2000 (in MTOE)

(WAES C2 Scenario)

Desired Imports	Oil	Natural gas	Coal	Total	Balance (Imports-Exports)
North America (1)	546	153	-	699	+ 510
Western Europe	836	163	107	1,106	+ 1,106
Japan	734	76	117	927	+ 927
Rest of the non-Communist world (excluding OPEC)	484	-	-	484	+ 402
International companies	275	-	-	275	+ 275
Total	2,875	392	224	3,491	+ 3,220
Potential exports					
OPEC	1,973	184	-	2,157	- 2,157
USSR	-	51	-	51	- 51
North America	-		189	189	-
South Africa & Australia (2)	-		51	51	- 51
Developing countries			82	82	-
Total	1,973	235	322	2,530	- 2,259
Balance	- 902	- 157	+ 98	- 961	- 961

(1) Canada and the United States

(2) Not shown separately in the table quoted

Source: Workshop on Alternative Energy Strategies (1976)

(iii) Another important question concerns the real long-term price for energy which might emerge as a result of adjustments in both supply and demand. According to the IIASA, the price per barrel of crude, in 1975 dollars, fob Persian Gulf, could reach 16.5 dollars by 1995 in the low-growth scenario of its energy study, and 22.3 dollars by 2010 in the high-growth scenario. For purposes of comparison, the mid-1978 figure was 10 dollars (1975) per barrel. It does not seem unreasonable, therefore, to assume as an order of magnitude a doubling of the real price of oil and, more probably, of energy between 1978 and the end of the century.

(iv) Finally, the volume of investment which will be necessary to meet the demand for energy must not be under-estimated. On a global scale the IIASA puts it at 4% of world income at the end of the century as against about 2% in 1975; the percentage might reach 6% for the developing countries alone. However, the maximum percentage will only be reached later, no doubt around the year 2025.

Thus, in regard to energy, the crucial period for mankind is much more that between 1985 and 2025 than the very long-term. The difficulties of facing up to this crucial period are both economic and political; at national level, public opinion does not understand that because of the necessary lead-times involved, measures must be taken even when there is no scarcity of energy in the short-term; at international level there are differences of interest between groups of countries in addition to the common interest of all in the long-term prosperity of the world economy.

4. INDUSTRIAL RAW MATERIALS

Overall physical scarcity of industrial raw materials due to natural depletion of resources and re reserves is not a likely eventuality.

The real problem is access to raw materials.

The possibility of a shortage of industrial raw materials has a twofold dimension: physical scarcity, due to the fact that the resources are not renewable, and economic scarcity, a concept which covers social and political constraints as well. It is now proposed to look at the obstacles to growth from these two points of view.

Overall physical scarcity of industrial raw materials through natural depletion of resources and reserves is not a likely eventuality. There may be some specific difficulties with a small number of particular materials in specific applications, but as long as the economic and technical course of developments is not disturbed by sudden unforeseeable breaks, the concern often expressed on this subject need not be subscribed to.

The real problem is access to raw materials. In most cases, the countries which possess the reserves or which produce the materials are not the centres of consumption. This is true for both the EEC and Japan and, in the case of certain raw materials, for the United States also. For the OECD countries the most crucial situations are those where there is, at the same time, a high regional concentration of reserves or production and high dependency on supplies from Eastern countries, from developing countries or from South Africa.

Apart from political uncertainties in general and direct or indirect export restrictions in particular, a problem of concern to some countries, notably the EEC countries and Japan, may be the considerable influence of multinational mining companies in the relevant mineral markets. Even if there is no actual indication that these companies intend to discriminate against specific countries, the question remains: what may happen if there are prolonged shortages for political reasons? Markets with only very few suppliers are naturally more liable to breed discrimination than those where there are a good number of competitors.

Moreover, the tensions between materials availability and political or social constraints related to environmental quality or even broader social concerns will increase still further in the future. Hence there may be a proliferation of public procedures for approving new investments together with a lengthening of the time taken to obtain authorisations. In many cases such authorisations will be based on purely political considerations rather than on a cost/benefit estimate. Admittedly, in cases of severe shortage, political attitudes may change rapidly, but to bring new mines into production, or to reactivate mines or processing plants after they have been closed down, takes many years.

These conclusions are discussed in more detail in the following pages, which contain a review of resources and reserves, a comparison of reserves and consumption, an analysis of the regional distribution of reserves, some figures on the oligopolistic market structure, and a consideration of social and environmental constraints.

Resources and reserves

Statistics on resources and reserves, which are the starting point for any study of the question of industrial raw materials, must be used with caution.

The starting points for any study on this subject are the statistics for identified or hypothetical resources and for reserves, namely that portion of the identified resources from which a useable mineral can be economically and legally extracted at the time of evaluation. But resources and reserves are "floating figures", not only because of increasing knowledge about the composition and structure of the earth's crust, but also because of changing economic parameters. If resources and reserves are defined as absolute quantities (in metric tons of metal content, for instance), their amount is dependent on the development of metal prices, on extraction, processing and transportation costs with given technologies and on relevant technological changes. If, on the other hand, they are defined in relative terms (such as foreseeable lifespans), the development of demand at given prices, the direct price elasticity, the development of relative prices and the elasticities of substitution have also to be taken into account.

Accordingly, the statistics have to be looked at and interpreted very carefully.

Table 12

Identified resources and reserves 1977
(metal content in millions of metric tons)

	Iron	Copper	Lead	Tin	Zinc	Aluminium	Titanium
Resources	195,000	726	1360	37.0	1800	7600	2015
Reserves	93,400	456	124	10.2	150	5000	394

	Chromium	Cobalt	Columbium	Manganese	Molybdenum	Nickel	Tantalum
Resources	5300	4.5	14.6	3,265	31.7	127.7	0.26
Reserves	820	1.5	10.7	1,814	9.0	54.4	0.06

	Tungsten	Vanadium	Bismuth	Mercury	Silver	Platinum	Asbestos
Resources	3.4	56.2	0.13	0.80	0.51	0.026	135.0
Reserves	2.0	9.7	0.08	0.24	0.19	0.009	87.0

Sources: The main source is the US Bureau of Mines: Commodity Data Summaries 1978, Washington 1978.

Although these data are relatively reliable in the light of present knowledge, a few comments are in order regarding some of them.

. First, not all the resource figures include seabed deposits. If these are also taken into account the resources of cobalt have to be increased by another 280 million tons and those of nickel, molybdenum and vanadium by 1350, 78 and 107 million tons respectively. Furthermore, manganese in ocean floor nodules is reported to be more than 30,000 million tons. In all these cases the increase in resources is more than 150%, and even virtually unlimited in the case of cobalt. Other minerals for which resource estimates are considerably increased if ocean floor nodules are taken into account are titanium, aluminium, lead, copper, bismuth, silver and, to a lesser extent, zinc, iron, chromium and tungsten.

. The reserve figures in Table 12 are based on average or even conservative assumptions. The data available for lead reserves range from 130 to almost 173 million tons. The estimates for zinc reserves are variously 150, 185 and even 274 million tons. The estimates for aluminium and manganese also seem to be comparatively low. On the other hand, the figures for titanium, tantalum and asbestos seem less conservative than the others.

In any case, if ocean nodules are taken into account, there are only a very few minerals for which the ratio between resources and reserves is less than 300%; in many cases it is far higher. For most minerals, the amount of potential resources already identified indicates that reserves may increase greatly if metal prices rise and/or technological progress accelerates. Even for those materials with a comparatively small margin between resources and reserves, the future development of the latter is not necessarily limited. Economic factors, notably a growth of demand and successful prospection may have a decisive influence. The case of aluminium is significant in this regard. Here the ratio between reserves and consumption is so high that there is no incentive to intensify prospection today.

Even admitting that the volume of prospection and exploitation in the last twenty five years may not be representative for the future, it is interesting to look at the development of reserves over that period. In nearly all cases there have been spectacular increases at precisely the time of the highest raw material consumption in history.

Table 13

Reserves, 1950, 1965/66, 1975/76 and 1977
(in millions of metric tons)

	(1) Copper	(1) Lead	(1) Tin	(1) Zinc	Bauxite	(2) Chromite	(1)(3) Molybdenum	(1) Tungsten
1950	100.0	40.0	6.9	70.0	1,400	NA	NA	1.9
1965/66	195.0	93.4	NA	75.3	5,964	2,414	2.2	NA
1975/76	408.2	150.0	10.2	135.3	17,272	2,841	6.0	1.8
1977	456.0	124.0	10.2	150.0	NA	NA	9.0	2.0

NA = Not available; (1) metal content; (2) Cr_2O_3 content; (3) Western world only.

Sources: National Commission on Supply and Shortages: Government and the Nations Resources, Washington 1976, p.16; Deutsches Institut für Wirtschaftsforschung: Die Entwicklung der Vorräte und des Verbrauchs einiger wichtiger, nichtenergetischer Rohstoffe im letzten Jahrzent, in: Wochenbericht No. 32/76, p. 294; Marion Radetzki: Will Long-Run Global Supply of Industrial Metal Minerals be Adequate? A case study of Iron, Aluminium and Copper. In: Institute for International Economic Studies, University of Stockholm, Seminar Paper No. 85, 1977, p.4; US Bureau of Mines: Mineral Facts and Problems, 1975 edition, Washington 1976; cf. also Table 12.

It would be interesting to know what part of the increase in reserves can be attributed to the discovery of new deposits, to price increases or to the development of new technologies. Unfortunately the figures do not tell us. It is practically impossible even to estimate the price elasticity of ore reserve tonnage with accepted econometric techniques; project lead-times differ greatly and the investment decision is normally based on a projected return which bears only an indirect relationship to the price prevailing at the time of the decision or to the price in effect when the new capacity comes on stream.

Reserves and consumption

Comparison between reserves and consumption prospects does not point to an absolute and universal physical scarcity, but this in no way precludes difficulties as regards certain minerals.

Any assessment of physical availability of raw materials obviously has to take into account not only resources and reserves but also consumption. One way is to divide the amount of reserves by present consumption and so obtain a static lifespan of the reserves indicating when these would run out were consumption to remain constant. But it is preferable to try to anticipate the future trend of consumption and get a dynamic lifespan by dividing reserves by the expected cumulative demand over a certain period, in this instance the next quarter-century (Table 14).

Even allowing for the uncertainty of these "floating" figures, one can hardly conclude that there is a general problem of physical scarcity of minerals for the future. From what is known at present, the situation is more critical for silver, bismuth, mercury and asbestos than for copper, lead, tin, zinc, molybdenum, tantalum or tungsten. But for iron, aluminium, titanium, chromium, columbium, manganese, vanadium and platinum, there are no foreseeable problems as regards physical availability on a worldscale.

Even for those materials for which given reserves may seem insufficient, the sitution is less dramatic than the statistics would suggest. Silver, for instance, can be replaced by aluminium in the manufacture of mirrors and other reflecting surfaces, by tantalum for surgical instruments and by stainless steel in tableware. Possible substitutes for bismuth are iron in the production of acrylonitrile and magnesium or aluminium compounds in pharmaceuticals; plastics too can replace bismuth alloys for certain applications. Moreover, if potential resources instead of reserves are related to cumulative consumption, the resulting ratio for silver is 1.6 compared with 0.6 and that for bismuth is 1.3 instead of 0.8

Mercury and asbestos present more difficult problems. Because of mercury's unusual combination of physical and chemical properties, there are only a few satisfactory substitutes for it, particularly in its principal uses - electrical apparatus, industrial and control instruments. However, for paints, agriculture, pharmaceuticals and in the chlor-alkali industry, it is quite likely that environmental considerations will reduce the consumption of mercury even more than supply shortages or high prices. For asbestos, there are as yet no substitutes in many applications, particularly for friction materials used in automobiles, trucks and other transportation equipment. Technological advances before the end of the century in the production of synthetic asbestos substitutes would therefore be highly desirable, particularly since asbestos poses environmental problems.

Table 14

Lifespan of reserves 1976 and ratio between reserves and cumulative demand 1976-2000

	Iron	Copper	Lead	Tin	Zinc	Aluminium	Titanium
Ratio of reserves to current demand (in years)	194	54	29	42	27	> 200	> 300
Ratio of reserves to cumulative demand 1976-2000	5.1	1.4	1.2	1.5	0.9	6.2	4.4

	Chromium	Cobalt	Columbium	Manganese	Molybdenum	Nickel	Tantalum
Ratio of reserves to current demand (in years)	> 300	44	> 800	185	108	83	60
Ratio of reserves to cumulative demand 1976-2000	10.3	1.3	17	4.6	2.2	2.2	1.8

	Tungsten	Vanadium	Bismuth	Mercury	Silver	Platinum	Asbestos
Ratio of reserves to current demand (in years)	57	> 300	30	30	20	110	22
Ratio of reserves to cumulative demand 1976-2000	1.4	8.2	0.8	0.9	0.6	3.1	0.5

Sources: US Bureau of Mines: Mineral Facts and Problems, op.cit. p.32 and INTERFUTURES calculations. For long-term estimates of consumption, see also W. Malenbaum: "Materials Requirements in the USA and abroad in the year 2000", Wharton School of Finance and Commerce, University of Pennsylvania, 1973.

Nevertheless, even if asbestos, bismuth or other comparatively scarce minerals such as barium, fluorine, germanium, graphite, gypsum. indium and mica, were to disappear completely - which is extremely unlikely - this would pose some problems in specific applications, but it would certainly be technologically possible to do without them. A supply shortage does not occur from one day to the next, and there will be a transition period during which the relative price will increase and substitutes will be sought. Thus non-essential uses will cease first, and this will stretch the material's lifespan for essential uses.

So there really is no universal or absolute scarcity of minerals. There may be some specific difficulties but if the economic and technological transition phases are not disturbed by sudden, unforeseeable breaks, there should not be any serious problem. Thus, the concern so often expressed about the exhaustion of resources, based on the undeniable but sweeping assumption that our world is limited, does not for the moment justify any change in present policies.

The regional distribution of reserves

The countries possessing the reserves are not often the centres of consumption, and in many cases there is also a very high regional concentration of reserves which, for certain countries and certain minerals, creates a political risk of discrimination as regards deliveries.

Much more important is the regional distribution of the reserves. In most cases, the countries in which there are reserves are not those which are the centres of consumption, and in some cases there is also a very high regional concentration of reserves. The question of access to raw materials could therefore be of more importance than overall physical availability. In the OECD area this is true of the EEC and Japan for most minerals and of the United States for some.

The situation is the following for the 20 most important minerals covered in Table 15 :

- 44% of reserves are held by the industrialised countries (OECD plus South Africa), 23% by the Eastern countries and 33% by the developing countries;

- Almost 90% of the reserves held by the industrialised countries are in the United States, Canada, Australia and South Africa;

- The USSR possesses more than 80% of the reserves of the socialist countries, but it must not be forgotten that prospecting in China is still in its earliest stages;

- In the developing countries, too, much of the reserves are held by a small number of countries, Brazil (25%), Chile (9%), Indonesia (7%), Zaire, Papua New Guinea and India (4%).

Consequently, not only Western Europe and Japan, but also most of the East European countries and about 70% of all developing countries have only very limited reserves of minerals.

Table 15

Regional distribution of measured and indicated reserves, 1977

Raw material	Share of leading 3 countries	Share of leading 5 countries	countries' percentage share
iron	59.4	76.7	USSR (30.2), Brazil (17.5), Canada (11.7), Australia (11.5), India (5.8)
copper	44.9	58.7	USA (18.5), Chili (18.5), USSR (7.9), Peru (7.0), Canada (6.8), Zambia (6.4)
lead	47.8	61.4	USA (20.8), Australia (13.8), USSR (13.2), Canada (9.5), South Africa(4.1)
tin	50.2	68.1	Indonesia (23.6), China (14.8), Thailand (11.8), Bolivia (9.7), Malaysia (8.2), USSR (6.1), Brazil (5.9)
zinc	45.8	58.6	Canada (18.7), USA (14.5), Australia (12.6), USSR (7.3), Ireland (5.5)
aluminium	62.8	74.8	Guinea (33.9), Australia (18.6), Brazil (10.3), Jamaica (6.2), India (5.8), Guiana (4.1), Cameroon (4.1)
titanium	59.0	74.1	Brazil (26.3), India (17.5), Canada (15.2), South Africa (8.6), Australia (6.6), Norway (6.4), USA (6.0)
chromite	96.9	97.9	South Africa (74.1), Rhodesia (22.2), USSR (0.6), Finland (0.6), India (0.4), Brazil (0.3), Madagascar (0.3)
cobalt	63.0	83.5	Zaire (30.3), New Caledonia (18.8), USSR (13.9), Philippines (12.8), Zambia (7.7), Cuba (7.3)
columbium	88.5	95.3	Brazil (76.6), USSR (6.4), Canada (5.5) Zaire (3.8), Uganda (3.0), Niger (3.0)
manganese	90.5	97.7	South Africa (45.0), USSR (37.5), Australia (8.0), Gabon (5.0), Brazil (2.2)
molybdenum	74.3	86.9	USA (38.4), Chile (27.8), Canada (8.1), USSR (6.6), China (6.0)
nickel	54.5	76.8	New Caledonia (25.0), Canada (16.0), USSR (13.5), Indonesia (13.0), Australia (9.3), Philippines (9.0)
tantalum (1)	72.7	84.8	Zaire (55.0), Nigeria (11.0), USSR(2.9), North Korea (6.4), USA (6.1)

(1) 1974 figures

Table 15 (continued)

Raw material	Share of leading 3 countries	Share of leading 5 countries	countries' percentage share
tungsten	69.6	80.6	China (46.9), Canada (12.1), USSR (10.6) North Korea (5.6), USA (5.4), Australia (2.7)
vanadium	94.9	97.2	USSR (74.8), South Africa (18.7), Chile (1.4), Australia (1.4), Venezuela (0.9), India (0.9)
bismuth	47.9	60.9	Australia (20.7), Bolivia (16.3), USA (10.9), Canada (6.5), Mexico (6.5), Peru (5.4)
mercury	65.2	78.3	Spain (38.4), USSR (18.2), Yugoslavia (8.6), USA (8.6), China (4.5), Mexico (4.5), Turkey (4.5), Italy (4.1)
silver	54.9	76.5	USSR (26.2), USA (24.8), Mexico (13.9), Canada (11.6), Peru (10.0)
platinum	99.5	99.9	South Africa (82.3), USSR (15.6), Canada (1.6), Columbia (0.3), USA (0.1)
asbestos	81.3	91.8	Canada (42.7), USSR (32.3), South Africa (6.3), Rhodesia (6.3), USA (4.2)

Sources: US Bureau of Mines: Mineral Facts and Problems, op.cit.
US Bureau of Mines: Commodity Data Summaries 1977, op.cit.
Bundesanstalt für Geowissenschaften und Rohstoffe/Deutsche Institut für Wirtschaftsforschung : Untersuchungen über Angebot und Nachfrage mineralischer Rohstoffe, Vol. VII : Chrom, Hanover/Berlin 1975.
cf. also Bundesanstalt für Geowissenschaften und Rohstoffe : Regionale Verteilung der Weltbergbauproduktion, Hanover, 1975.

An analysis of the regional concentration of the reserves of certain metals and one of the other minerals (Table 15) is even more informative. For seven of the commodities (chromium, columbium, manganese, molybdenum, vanadium, platinum and asbestos) more than three-quarters of the measured and indicated reserves are in only three countries. There are fifteen minerals of which more than 75% is held by five countries, and, of the twenty minerals cited, there are only two (copper and zinc) for which the five countries' share is less than 60%.

An interesting exercise in this context is the identification of those minerals for which there is both a high regional concentration of reserves and a high dependence of OECD countries on supplies from Eastern countries, from developing countries or from South Africa. The most striking examples are platinum, chromium, manganese and vanadium, in which South Africa and the USSR predominate, and columbium, in which Brazil has a strong position (1).

- As far as the platinum-group metals are concerned, 98.5% of the world reserves are in only two countries - South Africa and the USSR. Moreover, each of these countries specialises in one of the two major metals of the group. South Africa produces more than two-thirds of all platinum and the USSR two-thirds of all palladium. In most present uses - the automobile, chemical, electrical and petroleum-refining industries - substitution of other materials for platinum metals is theoretically possible. Moreover, because of the high unit prices of the platinum metals, they are even now used only when fully justified for technical and economic reasons. All told, any interruption of supplies would be a problem, at least in the short term, for all OECD countries except Canada.

- More than 96% of the reserves of chromium are located in only two countries - South Africa and Rhodesia. Chromium is used mainly for metallurgical, chemical and refractory purposes. As there is no known substitute for chromium in most metallurgical applications nor in certain chemical uses, it is a critical material for almost all OECD countries. As long as South Africa's exports continue, an interruption of supplies from Rhodesia would cause only short-term problems. If, however, supplies from both countries, and in particular from South Africa, were disrupted, the supply situation of the Western industrialised countries would become highly uncertain.

- As long as marine nodules are not being mined on a large scale, manganese can also be considered a critical mineral. The bulk of the reserves are located in South Africa and the USSR, but since production is more widely distributed than in the case of chromium or the platinum-group, it would be easier for the OECD countries to adjust in the space of a few years if certain supplies were to be interrupted. Nevertheless, the short-term effects would be serious because manganese is essential for the production of almost all steels, and it has no substitute in its main uses.

- In many respects the situation for vanadium is different. Even though the USSR and South Africa hold nearly all the reserves, the dependence of the OECD countries is much less. Other materials such as columbium, molybdenum, manganese, titanium and tungsten can substitute for vanadium and, allowing for a lead time of two or three years to start production, the United States could produce ample supplies from domestic reserves - or even be self-sufficient - while Europe and Japan could buy elsewhere.

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1) The situation for titanium would appear to be less precarious if account is taken of rutiles, ilmenites and artificial rutiles obtained from ilmenites.

Apart from these materials, in which there is a strong South Africa/USSR reserve position, there are a number of other minerals such as columbium and tantalum, of which three-quarters or more of the reserves are in developing countries, while for tin and tungsten, around 70% of the reserves are in developing countries and China. Of course, country positions differ according to the metal concerned, but by and large Europe and Japan are far more vulnerable to supply disruption than the United States.

Thus, the uneven distribution of reserves creates a political risk of discrimination concerning supplies of certain materials for certain countries. Whether there is also the possibility of generalised producer-country cartels aiming to increase selling prices is another matter, and will be examined later on in this report.

Oligopolistic market structures

Most mineral markets have a strong oligopolistic structure. Moreover, governmental influence will increase in many markets in future, as a result of nationalisation or state participation in joint ventures.

Except for the Eastern countries and a few developing countries where the mines have been nationalised in recent years, the mining industry is dominated by powerful multinational companies. Hence, most mineral markets have a strong oligopolistic structure. The most notable cases in point are bauxite, molybdenum, chromium, nickel and platinum (Table 16). Other materials for which there is a high supply concentration either by big international companies or by governments are titanium, cobalt, columbium, tantalum and vanadium. Moreover, in a number of cases the same companies operate in different markets, thus controlling not only one material, but also its substitutes, and not just at the mining stage: for instance, with a few exceptions, the same restricted group that produces columbium metals also processes tantalum, which may be used as a substitute for columbium in high-temperature applications.

Apart from pricing, the main policy issue in this context is access to raw materials; however, no hasty conclusion should be drawn. In the case of bauxite, for example, concentration at the mining stage is of little importance because bauxite mining is a relatively simple process and there are many possible alternative reserve deposits. The important aspect of concentration is in metal production. The situation is different again for those materials for which the market is mainly controlled by governments, for example palladium and cobalt. Where there is no pressing need for exports for employment and/or balance of payments reasons, politically-caused supply disruptions cannot be ruled out. What is more, governmental influence will increase in many markets because of nationalisation or state participation in joint ventures, particularly in the developing countries.

Table 16

Company concentration in metal production
(excluding Eastern countries and China)

Metal (Mining/Production/ Capacity	Share of biggest company	Share of first 3 companies	Share of first 5 companies	No. of companies supplying 65% of the market
Bauxite production 1976	17.0	35.0	48.2	9
Alumina capacity 1974	22.7	46.1	65.2	5
Aluminium capacity 1974	15.3	34.4	48.8	11
Molybdenum mining 1974	41.9	59.8	71.6	4
Chromite mining capacity 1974	16.5	41.0	53.7	9
Nickel production 1976	35.4	54.2	62.4	6
Platinum production 1974	48.8	91.5	96.5	2

Sources : Mining Annual Review 1978, pages 84 et seq;
Falconbridge Nickel Mines, Annual Report, 1977

It is not easy to form a general opinion on the consequences of supply concentration in the case of markets where only a few private companies operate and the degree of vertical integration is low:

- On the one hand, even the big international companies have to sell their products. That in some cases producers are able to act as price leaders in world markets (for example, AMAX for molybdenum, INCO for nickel, Rustenberg for platinum), and thus make bigger profits, may be regrettable from the standpoint of the market's functioning, but it does not endanger general access to raw materials as political intervention might. The same applies to the simultaneous existence of a producer price for mid-term and long-term contracts and a merchants' market price, generally responsive to short-term demand conditions.

- On the other hand, a market with few suppliers is naturally much more liable to engage in discriminatory practices, either spontaneously or because of government intervention. An example of the latter is the directive of the US Bureau of Commerce ordering the principal US suppliers of nickel to set aside a considerable share of their average monthly shipments, calculated by reference to a given period, for defence-related orders. During the Vietnam war, when there were no bottlenecks in the nickel supply for United States defence purposes, the big companies distributed nickel to their customers in such a way that European and Japanese consumers had to buy USSR nickel at prices 500% above the list.

Even if it is held that what happened with nickel was a chance incident and one that is unlikely to be repeated in the case of molybdenum, say, and even if there is not the least indication that the big multinational companies intend to discriminate against specific countries, there remains the question of what would happen in the future if there were longer-lasting shortages due to political reasons. For the European countries, Japan and the non-producer countries of the Third World, this is a question of serious concern, especially since many of the big mining companies have also pursued a policy of vertical integration from mining through to the stage of the semi-finished product. The question of preferential intramultinational-company supplies in a critical situation might well be much more than just academic.

Environmental and social constraints

Environmental considerations and public attitudes to resource development will in future have an impact on raw materials availability.

Environmental considerations and public attitudes to resource development will in future have a great impact on worldwide or regional availability of raw materials.

The great variety of environmental problems in the field of mineral extraction and processing can roughly be devided into three categories : the impact on land, on water and on the atmosphere, and lastly on the social environment.

The difficulties may stem from the impact of mineral extraction and processing on land, on water, on the atmosphere and on the social environment.

(1) In terms of volume, six materials - iron, phosphorus, bauxite, manganese, copper and chromite - account for more than 95% of world mining production. If one assumes that the average annual growth in consumption between now and the year 2000 will be 2.8% for iron and manganese, 3.9% for copper and 5% for phosphate and bauxite, world production will be around 2.5 times what it is today. Since most of the mining operations for these minerals are carried out at the surface, the question of land use and rehabilitation is becoming increasingly important.

The same applies to the increased utilisation of lower grade ores. More and more material has to be extracted for a given weight of metal, and increasing quantities of waste, mostly solid, have to be disposed of. The case of copper gives an idea of the order of magnitude of the problem. In 1973, for a US mine output of 320 million tons of copper ore, about 758 million tons of waste material was moved and discarded. The 273 million tons of copper ore milled the same year produced 6 million tons of concentrates, leaving some 267 million tons of tailings. And the production of 1.8 million tons of blister copper at the smelting stage was accompanied by 3 million tons of solid waste in the form of slag. There is no doubt that the ratio of ore to waste, as well as the ratio of metal to ore, will continue to worsen in the future.

There is another problem which cannot be neglected: the nature of the land used. If surface mining is extended more and more to areas with fragile ecosystems such as the Arctic or permafrost regions where balances, once altered, are difficult to restore, the rehabilitation of land after mining becomes a particularly serious problem. Progress in rehabilitation will be expensive and slow in areas where the soil cover is thin, micro-organisms are delicately balanced, the overburden in acidity or salinity is high and rainfall is low.

(2) As to the impact of mining and raw material processing on water and the atmostphere, the range of problems is vast. Apart from the usual pollution problems like mine drainage, sulphur discharge and dust and noise emission, there is one new problem posed by future mining operations. Once the institutional issues are settled and international agreements worked out, mining on the outer continental shelf and in the deep ocean will probably become a rapidly growing worldwide industry. Unless the technologies developed and used to extract, transport and process the deepsea minerals are completely compatible with environmental objectives, there is a potential danger of serious environmental deterioration.

Where the national waters of the developed countries are concerned, although mounting awareness of environmental implications in those countries may ensure that activities start only after satisfactory environmental impact studies, this is less certain for international waters or for the rest of the world. Recommendations such as that of the US National Academy of Science that "industry must be willing to disclose data on the technology of mining pertaining to those elements of mining systems that directly intersect with the environment" may sound revolutionary, but they show that it would be just as useful to devise a system whereby proprietary information of the private sector and the marine environment could be simultaneously protected, as to reach agreement on deepsea mining rights and the distribution of royalties.

(3) The new societal hostility towards resource development is important as a social constraint on the increase of reserves. Many communities do not wish to have minerals developed within or near their boundaries because of adverse environmental and social side-effects. On the contrary, in a certain number of advanced countries, the prevailing attitude is more and more one of letting such developments occur "elsewhere". Such attitudes, spread over a whole country, can quickly transform a local issue into a national one.

Even if the environmental and social constraints prove to be fairly flexible, the importance of the current anti-mining movement should not be underestimated, particularly in the context of severe shortages which affect the standard of living. The disadvantages of shortages, compared with the negative side-effects of mining, will be evaluated differently from one community to another, thus leaving scope for effective local opposition. Moreover, in mining the lead-time between the investment decision and the start of production is so long that the social pressure to reverse the trend may come too late. Finally, because of the increasing amount of energy needed either to mine deeper and deeper or to use progressively lower-grade ores, energy policy may also prove to be a social constraint on long-term mineral supplies. This is of indirect but nevertheless more than marginal relevance.

So the tension between materials availability and environmental and social constraints is likely to increase. Insofar as today's externalities can be internalised in the form of pollution abatement costs or rehabilitation expenditure, the market will continue to play its regulatory role. However, materials availability will not only be influenced by rising relative prices reflecting increased demand or higher costs (more difficult mining conditions, declining quality of ores, rising expenditure for environmental protection); it will be affected by other factors such as the growing array of assessment procedures to open up the decision process on new investments and longer waits for authorisation. In many cases, authorisation will be based on all-or-nothing political decisions. Political will may change quite quickly if severe shortages arise, but to bring new mines into production or reactivate mining or processing units after they have been closed down takes time.

Three questions emerge from the foregoing analysis:

- *How to ensure the various countries' access to raw materials?*
- *How to prevent an investment shortfall in this field?*
- *What may be the long-term trend of prices?*

So, as a result of this study of physical limits on raw materials, three questions arise, given the understandable and inevitable tendency for the various countries, both developed and developing, to control their own natural resources :

. How can we avoid discriminatory practices restricting certain countries' access to raw materials, or certain producers' access to markets?

. How can we prevent economic, social and political difficulties from leading to insufficient investment, which in the mid-term may mean shortages and therefore price increases higher than the long-term trend?

. What may be the long-term trend of prices, given that mines are going deeper and deeper and that ores of decreasing concentration are being progressively extracted, and bearing in mind the impact of energy and environmental protection costs?

These three questions are not causally linked with the emergences of a global and physical shortage. They are mainly economic, political and social, and will accordingly be discussed at a later stage in this report.

5. THE PHYSICAL ENVIRONMENT

The physical effects of human activity on the environment differ according to their degree of reversibility and the probability distribution of the combined total of the risks.

Is it a fact that, because of the indirect - and often cumulative - consequences of the scale of his economic activities, man is compromising the survival of the other animal and vegetable species and his own? This is a question to which no one can remain indifferent but it is necessary to distinguish clearly between the problem it poses - that of protecting humanity against the considerable and very uncertain risks inherent in destructive action on the ecosphere - and the more tactical issues like maintenance of the local environment or the elimination, at least partial, of pollution.

While the most reversible effects can be reduced at a cost which would appear to be reasonable, the effects likely to be irreversible pose more complex problems as regards strategy.

In other words it is absolutely essential to classify the physical effects of human activity on the environment according to:

. the degree of reversibility (which naturally depends on the time and money spent on eliminating those effects),

. the probability distribution of the combined total of the risks which may be inflicted on humanity and on the ecosphere (the assessment of which depends on the state of our knowledge, the prospects for the emergence of new techniques, and the time horizon considered).

Three specific fields deserve consideration: the climate, water and toxic materials.

The most reversible effects may no doubt be maintained constant and even reduced at a reasonable cost: according to W. Leontief (1976), it will be possible with 1.5% of national income, and by devoting 5% of the national capital to anti-pollution equipment, to bring this pollution down to the level of very strict norms. As a first approximation, the local protection of the environment would therefore not affect economic growth adversely, and would at the same time contribute to the welfare of the community. However, the situation becomes doubly complicated when international relations are introduced :

- The various countries may adopt widely differing norms for pollution control. This is perfectly natural since local environments may have different assimilation capacities, and differing political choices may be made between the level of pollution and the economic development of certain sectors. But certain States may, because of this, inflict external costs on others: for example by turning away industries of countries at the same stage of development while at the same time causing pollutions which go beyond their own frontiers.

- More generally, pollution control will be a source of tension between countries when international cooperation is insufficient to protect a region of a country or a marine area to the degree desired by one of the governments concerned.

As for the effects which are likely to be irreversible, these pose unusually complex problems. Besides the uncertainties resulting from the distant time horizon and the insufficiency of our present knowledge of ecological systems, there are also the uncertainties represented by possible scientific discoveries and new techniques. The whole outlook may be changed by the discovery of new irreversibilities with serious consequences or, on the contrary, by the use of processes for eliminating the risk. In these conditions, the only reasonable strategies which avoid both a shortsighted passivity and the premature adoption of important structural changes will be :

. intensification of research to improve the level of our knowledge,

. ongoing assessment to see whether the time has come to adopt costly protective measures (for example, analysis shows that this is not yet the case for emissions of carbon dioxide into the atmosphere),

. avoidance of policies involving long-term risks when this does not entail high costs.

In this connection, and with due regard for the fact that questions relating to the loss of productive soil have already been discussed, three main fields need close attention: the impact of human activity on the climate, the problem of water, and toxic materials.

The climate

The interrelationships between the climate and human activities constitute a subject of primary importance which governments cannot afford to ignore, but in the short term the main thing is to finance research in climatology in order to increase knowledge of the phenomena.

The influence of human activity on the climate, the effect of the climate on mankind: these two processes are obviously not distinct from but influence each other. But in both cases the first thing to be recognised is the extraordinary complexity of the phenomena and the enormous extent of our ignorance. In spite of the progress made in recent decades in the collection of the basic facts, in the power of computers and in theoretical analysis, meteorologists have to deal, as scientists, with terribly difficult problems. Thus most of the variously sensational forecasts desseminated in recent years are not supported by the vast majority of the profession.

Accordingly, this report will deal only with those aspects which seem to be generally accepted.

- The growing use of fossil energy for fuel results in a steady increase in the concentration of carbon dioxide in the atmosphere: it is known, from the measurements taken in the 1940s, that the CO_2 content of the atmosphere was then 290 ppm. It reached just over 300 ppm per volume in 1950 and 330 ppm in 1975, with a growth rate in the last decade of 1 ppm per year. The carbon dioxide emitted is partially absorbed by vegetation, which assimilates the gas in its metabolical processes, and above all by the oceans (in the long run, oceanic CO_2 is chemically bound into solid carbonates which form sediments on the ocean bed). According to some forecasts, the concentration of carbon dioxide could reach 380 ppm by the end of the century. There is no doubt but that this increase will raise the equilibrium temperature of the earth. But by how much? And what will be the geographical distribution of it? According to the models, an increase of 100 ppm in volume will bring about an average increase of 1°C, the effect being most perceptible at latitudes of above 55°, and in the stratosphere. The agricultural consequences are likely to be very considerable. One obvious counter measure would be to limit the use of fossil energy, another possibility would be to send the CO_2 coming from thermal power stations directly into the ocean, but knowledge of these phenomena remains rudimentary.

The conclusions of the 1977 IIASA seminar (already quoted) are that research activities must be intensified, and that the future will not be compromised if no account is taken of this problem in the decisions of the next decade.

- During the last five years a lively controversy has developed as to the effects on the ozone layer of manmade effluents, and in particular nitrogen dioxide and the chlorofluorocarbons. Although there is still much to be learned about the processes of formation, destruction and transport associated with ozone, it seems to be accepted that, if the reduction of the ozone layer were less than 20% the surface temperature would probably not change. Since the world community is aware of ozone problems, it seems unlikely that a reduction of that size would be tolerated.

- A considerable quantity of particles enters the atmosphere from both natural and manmade causes. There is not complete agreement as to the net effects on earth temperatures of an increase in the concentration of particles, but the present consensus among meteorologists is that it would cause a warming of the lower atmosphere.

- With the development of energy consumption, the volume of waste heat, that is to say the thermal power spread around the globe, could rise from 5.5 x 10^6 MW in 1970 to 31.8 x 10^6 MW by the year 2000. Distributed evenly over the globe, such an increase does not pose a major problem, but since much of the thermal discharge is concentrated in areas of economic activity, it would create local or regional problems. In the very long term, it may well prove necessary to study very carefully the location on a global scale of emissions of thermal waste to ensure that the effects on the climate are acceptable.

- The climate may be modified by urbanisation, extensive irrigation development and the transformation of forests into farmland, but present trends will not cause more than local problems, at least up to the end of the century.

- Finally, what about climatic fluctuations? In recent years, opinions among meteorologists have been divided as to whether the world is entering a new climatic norm, and if so what the new norm is likely to be. Unfortuntely, any statement of this kind remains a hypothesis which cannot be proved physically one way or another, and it is highly unlikely that the state-of-the-art will advance sufficiently to resolve the question during the next decade or so. On the other hand, there is increasing consensus that climatic fluctuations have become more extreme in recent years, which means wider fluctuations in food production, both regionally and globally.

Thus, the interrelationships between the climate and human activities constitute a subject of primary importance which governments cannot afford to ignore, but in the short-term the main thing is to finance research in climatology in order to increase our knowledge of the phenomena and make full use of the time that remains during which it is not necessary for decisions to take account of the impact of human activities on the climate.

Water

From now until the end of the century there should not be any problem of water supply on a global basis, but extending the availability of safe

From now until the end of the century, there does not seem to be any problem of water supply on a global basis.

Nevertheless, to extend availability of safe water supply in the rural areas of the developing world is certainly one of the major objectives until the end of the century. A WHO survey shows that at the end of 1975, taking the whole of the rural and urban populations of the Third World, only 35% (638 millions) were adequately served, and even that is an average figure which conceals the usual enormous disparities: in Africa less than 5% of the rural population of many countries have access to safe water (Burundi, Gabon, Madagascar, Sierra Leone, Kenya, Gambia, Togo, Zaire, Ethiopia, Guinea, etc..). Even if the targets of the Second Development Decade are met for Africa by 1980, which now seems unlikely, and this target is continued to the year 2000, the number of people without safe water will continue to increase over time (Table 17).

Table 17

Water supply situation in Africa 1970-2000

(Population in millions, not including Angola, Equatorial Guinea, Malawi, Mozambique, Namibia, Ruanda, South Africa, Rhodesia, Swaziland and island countries and territories)

	1970			2000		
Population	Total	Served	Not served	Total	Served	Not served
Urban	79.0	51.2	18.8	307.0	307.0	0
Rural	210.6	40.8	169.8	506.0	126.5	379.5
Total	280.6	92.0	188.6	813.0	433.5	379.5

Source: World Health Organisation, 1976.

Water development projects can have a large impact on physical environment: erosion, salinity, the spreading of water-borne diseases - but these are only local questions.

As for the contamination of the oceans by hydrocarbons, the the amount of hydrocarbon entering the oceans may be expected to increase linearily at the rate of 0.1% total of crude production up until 1990 and level out thereafter. But the impact of the problem is no doubt more local or regional than worldwide.

Toxic products

The risks that toxic products involve for the environment are difficult to assess. Consequently, the question is a

Man produces more than a million types of products, most of which eventually become waste which has to be disposed of in an environmentally acceptable manner. Many of these waste products are highly toxic to different organisms, and their impacts depend on the type of organisms concerned, specific life states of the organism, and the presence of other deleterious substances in the environment. Thus:

controversial one. However, innovations now proceeding in the chemical industry should change the basic circumstances of the problem by the end of the century.

- A whole list of heavy metals are attracting attention because of their toxicity. In the case of mercury, the measures already taken have reduced the possibility of mercury poisoning, but has not completely eliminated its occurrence. But mercury is only one of approximately 20 metals like lead, arsenic, cadmium, chromium and nickel, that warrant attention.

- The dangers created by PCBs (polychlorinated biphenyls) were only seriously noted in the early 1970s, but many countries took swift action then.

- The long-term utilisation of pesticides can be seriously questioned, since, because of the increasing concentration of pesticide residues as they move up the food chain, the toxic effects will be most readily noticeable in the higher carnivores. Moreover, the continued large-scale use of pesticides has resulted, through natural selection and evolution processes, in the appearance and proliferation of new strains of resistant species that generally turn out to be more harmful than their original counterparts.

By the end of the century - and granted that this is a controversial point - it would seem that the innovations now proceeding in the chemical industry will radically change the basic circumstances of the problem; in the meanwhile, bearing in mind the absolute necessity of increasing agricultural production, there is hardly any other course open than to use existing pesticides more selectively.

Thus, protection of the physical environment does not for the moment constitute an obstacle to the development of economic activities. In a number of cases, it can even make for a more harmonious pattern of growth that better reflects the aspirations of the population. This is a field in which governments, both of developed and of developing countries, must be ever ready to act, whether it be to finance research to improve the state of our knowledge, or to take conservation measures, or to solve local difficulties which can be considerable.

6. A DIFFICULT TRANSITION

The economic growth of the countries of the world, taken collectively, can continue during the next half-century without encountering long-term physical limits.

At the end of this first part of the report, it appears that the question of the physical limits to growth arises in terms significantly different from those which are very often used. Ignoring for the moment the finer distinctions which must be made, three broad conclusions emerge :

(i) Even though mankind must concern itself increasingly with the impact of economic activities on the environment in all its forms, the economic growth of the countries of the world taken as a whole can continue during the next half-century without encountering long-term physical limits. However, as we have seen, it may well be necessary to improve, in certain respects and above all on a national scale, the content of that growth.

However, this enormous period of transition in relations with the *ecosphere will be marked by problems in which constraints as regards physical availability will be closely bound up with economic and social constraints.*

(ii) On the other hand, mankind is in all probability going to experience an enormous period of transition in its relations with the ecosphere: enormous in its duration - between a half-century and a full century; enormous in its scope - a tripling of the world population from 4 to 12 billion, profound changes in agriculture, massive substitutions in primary energy sources following the decline in conventional oil production. During this period, the constant adaptation of requirements (resulting from demographic growth and and economic development) and the flow of resources will raise complex questions at the national and international levels. Throughout this period, constraints as regards physical availability will be closely bound up with economic and social constraints.

What is more, the questions which will arise in the course of this period will be inseparable from the socio-political challenges which will confront national societies.

(iii) Lastly, the questions which will arise in the course of this transition period, and particularly in the course of the next 25 years, are inseparable from the socio-political challenges which will confront national societies: the reduction of birth rates, migration, development of agricultural production, food aid, access to energy or mineral resources, growth of nuclear energy, non-proliferation, and commodity pricing - no matter which of these problems one considers, one finds the world inevitably "fragmented" so that the totalisation of resources and requirements on a world scale is of limited value.

Finding a solution to problems of physical availability during the transition period means clearly identifying their causes and introducing, as the case may be, either official incentives and controls or signals directed towards the market to ensure that it functions more in accordance with social objectives or longer term requirements.

Thus, the transition to stable populations will not be achieved solely through the availability of family planning techniques and their promotion by governments. It will be the result of a more fundamental change in motivations brought about by economic, cultural and social developments. The development strategies followed by the countries of the Third World during the next few decades will have a considerable influence in this respect.

As regards agriculture, the main transitional problem is the development and introduction of agro-systems that are resilient in the long-term and thus do not result in the destruction of arable land, increased resistance to insecticides or water pollution. Institutional and technological efforts will be needed to solve this problem.

In the developing countries, what are needed are institu measures involving agricultural reform, increased participation the rural population in economic and political life, and wider dissemination of technical information, while in the OECD countrie measures must be taken at market level to reduce the negative effec of agriculture on the environment.

At the same time, however, it is essential gradually to bring in technologies which ensure the resilience of agro-ecosystems - particularly in certain areas which are ecologically vulnerable. This will entail, among other things, an increase in fundamental research and R&D by the OECD countries, and an increase in aid-financing of agricultural research in the Third World; financing amounts at present to no more than US$ 0.5 per hectare of arable land, which seems totally inadequate in view of the scale of the problems. Yet there are possibilities for technological innovation both for the expansion of conventional agriculture and in the development of non-conventional industrial-based foods, but the lead times for these are commonly greater than 10-15 years, and they are inappropriate for many of the current problems. The production of industrial-based food will be part of a major new growth sector, the biotechnology industry. However, its products will generally be too expensive for people in Third World countries where transition problems in conventional agriculture may continue to result in supply shortages. Furthermore, these high technology opportunities are commonly dependent on another sector, which may experience severe transition problems, namely the energy sector.

As regards energy, the substitution of coal and nuclear energy for oil, and also the substitution of renewable sources of energy for fossil fuels - particularly if the problem of carbon dioxide were to appear inevitable - implies enormous upheavals. Massive increases in coal production and distribution will come up against difficulties as regards employment, the environment and transport infrastructures. Nuclear energy will have to overcome technical difficulties (the elimination of radioactive waste) as well as social and legal obstacles. Large-scale development of solar energy will only be feasible during the course of the next century, and will imply substantial R&D efforts in the meantime. Lastly, the longer the transition takes, the greater will be the consumption of wood in the Third World countries where the destruction of forests will have serious ecological consequences.

Where raw materials are concerned, several transitional problems are worth recalling: the development of techniques adapted to mining of low-grade ores, land-rehabilitation after mining is finished, the working of deep or remote mines or mines with a vulnerable environment; the settlement of institutional questions relating to the law of the sea and the preparation of technologies for exploiting the sea-bed; the quest for processes whereby industry can substitute materials in relatively plentiful supply for those which are more scarce; the establishment of political and economic conditions such as to ensure sufficient investment in the raw materials sector.

Lastly, among the major problems involved in preserving or improving the physical environment, it is important to stress the need for research on the climate, more extensive distribution of safe water in the Third World, and improved protection against toxic products.

To this list of problems, however, must be added all those of which the content, both national and international, is mainly economic, social and political. These problems have been touched on in Part I of this report, but a true insight into them may be had only in the much broader context of the analyses which follow.

PART TWO : PAST TRENDS, FUTURE DIMENSIONS

The order of procedure will be to review the major trends of the last quarter-century and so establish a framework for the future, then to introduce the INTERFUTURES scenarios, list the dimensions around which they are constructed and outline the orders of magnitude to which they lead.

All prospective analysis has its roots in the past and the present. Despite the different readings that are possible, a review of the major trends of the past quarter-century by way of a prologue will inevitably make it easier to establish a framework for the future. The path is not traced out. Current trends leave room for a number of different lines of development; more or less abrupt changes of direction are conceivable, both because of the efforts of the main actors involved to carry out the projects they are planning and because of the uncertain effects of confrontation between those projects. Hence the interest of scenarios which, far from being forecasts, are precisely intended, on the basis of different hypotheses concerning those projects, to explore their possible consequences in the form of sequences and images (1). By describing the significance of these scenarios, listing the dimensions on the basis of which they are constructed, and outlining the orders of magnitude to which they lead, it is possible to propose a set of references for the discussion of the three main issues which form the substance of the subsequent parts of this report.

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(1) The word "image" here means a description of the situation at the end of a sequence.

1. THE LAST QUARTER-CENTURY

Fundamental political changes, an unprecedented economic boom and a redistribution of relative economic situations among the various societies have marked the last quarter-century.

The fifty years between 1925 and 1975 were split into two unequal periods by World War II. The first 15 years were marked by the Great Depression, the break-up of the present North into three parts (the Western democracies, the Fascist-inspired régimes, communist USSR) and... the conviction that the West would continue to dominate the South for a long time to come. When the invasion of Poland began, 80% of the earth's land areas and 75% of the world's population were controlled by the West as it then was, while 25% of each belonged to the British Empire.

It is these trends which have caused the present uncertainties that presage future change.

World War II changed this situation entirely. In the North it substituted a binary division for the ternary division; its end marked the start of almost 30 years of economic growth; it sparked off the rapid disappearance of colonialism. It is by measuring the distance separating the world of 1950 from that of 1975 that one realises what upheavals are possible between now and the end of the century. First we shall describe this distance in terms of its main features: political change, global economic development and trends peculiar to the developed societies or to the developing countries. We shall then endeavour to detect the signs indicative of future changes.

A quarter of a century of political change

Great political changes, though not precluding a stability favourable to economic growth.

Preservation of the balance between the two superpowers despite the steady advance of the USSR, the arrival of communism in China followed by that country's break with the Soviet Union, and the accession of the Third World to political independence (from 51 in 1945, membership of UNO has risen to 151) - these are without doubt the most important political developments of the last twenty-five years.

But to these must be added certain more specific developments; the rise of Japan and the creation of the Common Market; the end of Stalinism and the development of East-West cooperation; the inception at Bandung of the "non-aligned" movement; the formation of the Group of 77. But all in all, despite the trend away from a bipolar world towards a mutipolar world, a certain stability remained which was enough to make economic growth possible.

An unprecedented economic boom

The unprecedented economic boom of the last quarter-century can probably be attributed to the regulatory role played by the United States, and to the adaptability which

A few figures are revealing :

. The world population of 2.5 billion in 1950 must be compared with that of 4 billion in 1975.

. Between 1948 and 1973, world production grew at an average of 5% per year, an all-time record which allowed per capita income to increase at an annual rate of approximately 3%: 3.2% per year from 1950 to 1975 in the OECD countries, and 3.1% in the developing countries.

ensued for many societies from the upheavals of the war or from accession to independence.

- During the same period (1948-1973), world value added in industry, expressed in US dollars at 1970 prices, increased from $234 to $1,023 billion, i.e. a rate of growth of more than 6%.

- Agricultural production doubled in the space of 25 years (1950-1975) in the developed market-economy countries, and grew during the same period by 130% in the developing countries (excluding China).

- This enormous economic upswing was inevitably accompanied by an explosion in world trade and increased interdependence: between 1948 and 1973, world trade expanded by a factor of 6, thus growing almost 50% faster than world production.

Why was this growth during the last quarter of a century possible? No doubt for two reasons, which will have to be taken into account in prospective analysis :

(i) Despite its great political and ideological rivalry with the Soviet Union, the United States found itself at the end of World War II the undisputed dominant economic power. It possessed a power to determine the rules of the game which was given de facto legitimacy by the consent of its European allies. In addition, the principles promoted by the United States (non-discrimination, reciprocity, lowering of customs barriers) were not formally contested by anybody and the United States deliberately avoided giving priority to its interests alone. In this way, a set of rules was established facilitating the effective reallocation of production factors at international level - which some people have called an International Economic Order. The principal components of that order are known: freedom of trade, internationalisation of capital movements, transfers of technology, an international division of labour that favours productivity growth, a monetary system that ensures stability of exchange rates, and all of this sustained by a few intergovernmental organisations with specific functions : the IMF, the GATT, OECD, the World Bank.

(ii) The political, social or economic upheavals caused by war in Europe and Japan or by decolonisation in the Third World no doubt gave many national societies increased adaptability, thereby providing those who sought change with the means of concrete expression (1). It is significant in this respect that, among the major developed countries, the rate of growth of GNP per civilian job was lowest in the United States and Great Britain, i.e. the countries which suffered less than others from the upheavals of war.(Table 18).

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(1) See below the discussion of the paper by M. Olson: "The political economy of comparative growth rates". Vol. 2 of the study series of the Joint Economic Committee, US Government Printing Office, Washington,

Table 18

Annual GNP growth rate per civilian job

	1950-1965	1965-1971
United States	2.5	1.3
France	4.6	4.9
Germany	4.8	4.3
United Kingdom	2.2	2.5
Italy	5.5	5.7
Japan	6.8	9.7

Source: OECD, National Accounts and Labour Force Statistics.

This is the first indication that growth rates mask profound changes in relative situations.

Trends in the developed countries

As between developed countries, the main feature has been the narrowing of per capita income differentials.

In the developed countries, the considerable disparities between the levels of economic development of the United States, Western Europe and Japan which existed after World War II (Table 19) have narrowed markedly. The inevitable consequence of this has been the relative decline in the GNP of the United States but, despite this, the United States still has substantial advantages over its OECD partners with regard to natural resources, agricultural output potential and the internationalisation of its production via multinational firms. Conversely, Germany and Japan are front-ranking industrial powers, while France and Italy are industrialising in depth for the first time in their histories.

Throughout this period the growth processes of North America, on the one hand, and of Western Europe and Japan, on the other, have been mutually reinforcing. The result has been a more rapid growth of productivity in Europe and Japan, a narrowing of the technology gap and a shift in industrial structures and trade flows. With time, the conditions of competition between the three poles have changed, and these changes lie at the root of some of the present problems as between advanced industrial societies.

Table 19

Trend of the share in production
of the seven major OECD countries

Percentages of the seven countries in total GNP (1)

	1955	1960	1965	1970	1974
United States	64.5	61.6	58.3	53.9	46.7
United Kingdom	8.6	8.7	8.3	6.9	6.4
France	7.8	7.4	8.0	8.6	9.2
Germany	7.3	8.5	9.4	9.9	12.8
Canada	4.3	4.5	4.1	4.3	4.7
Japan	3.8	5.1	7.1	11.0	15.1
Italy	3.7	4.1	4.7	5.2	5.1
Total	100.0	100.0	100.0	100.0	100.0

Source: OECD, National Accounts

(1) In dollars at current prices (conversions to the exchange rates for the year in question).

During this period trends in the developed countries have shown a few basic features in common :

- *great structural adaptability;*
- *importance of macro-economic policy;*
- *state support for development;*

Which of the major changes that the advanced industrial societies have gone through in the last 25 years should be singled out? We have selected a few which are fundamental to the questions raised in this report, though they are not set out in any particular order of significance.

(i) During the last quarter-century the industrial societies have shown remarkable structural adaptability, whether with regard to the composition of final production, migrations within sectors, between sectors and between regions, the technologies employed, the links between enterprises and groups, the internationalisation of production, or the characteristics of labour supply and demand. Some conclude that the same would happen tomorrow if growth were to resume at a sustained rate, but is this so certain?

- *growth of the role of the Welfare State;*
- *robustness of the market;*
- *progressive emergence of macro-economic imbalances;*
- *a broad consensus on the growth objective.*

But it is important to remember the big cultural and institutional differences that have persisted between developed countries.

(ii) Structural adjustments have been greatly facilitated by the functioning of the two major economic institutions: the State and the market. In particular, though with big differences from one country to another, the responsibilities of the State have become much more varied. D. Bell (1976) points out that it has taken on three new responsibilities: macro-economic control, support for development and a "normative social policy" aimed at "correcting the consequences of all economic and social inequality".

(iii) The macro-economic policy of government control of the three major factors of equilibrium (prices, employment, balance of payments) has permitted relatively steady growth and consequently reduced uncertainties, increased the propensity to invest and contributed to the development of positive attitudes to structural change. The end of the period, however, has seen the emergence of forms of unemployment not explainable by cyclical phenomena and forms of inflation which were ~~not the~~ result of full utilisation of productive capacity, whilst, in some countries, the external constraint has been weighing more heavily on growth possibilities.

(iv) State support for development (and notably State intervention in the restructuring of the productive system, in the regional distribution of activities, and in research) has, on the other hand, varied widely as between OECD countries throughout the period, and this is one of the respects in which the OECD economies differ most from one another.

(v) As regards the role of the Welfare State, the government has had progressively to contend with what D. Bell has called "the revolution of rising entitlements", a flood of varied claims from all the social groups aimed at obtaining for their beneficiaries the right to allowances in kind or in cash financed out of fiscal or para-fiscal resources. The development of the Welfare State, more pronounced in some OECD countries than in others, has certainly helped to humanise growth and facilitate structural change. However, it has gone hand in hand with an oligopolisation of social life, each group tending to organise itself for negotiations with the government and with other groups and thus choosing political institutions rather than the market in order to get its demands met. Whence a two-point question concerning the effectiveness of the Welfare State. Does it tend to favour the non-market sector beyond the aspirations of the majority of the population? Does the way in which it is organised create distortions between its objectives and the real effects of its actions?

(vi) In the last quarter-century, the extension of the Welfare State's role has gone hand in hand with a remarkable robustness of the market as an economic institution. Whence the conviction shared by many economists that the market is capable of handling most future adjustments. However, a number of doubts have been coming increasingly to the fore. Does the market anticipate the future in a manner consistent with the goals of society as seen by the government? Does it not generate a great number of negative external effects? Will it be able to cater for the so-called "non-market" demands that are likely to develop in the future? Does it not create too many inequalities in social distribution?

(vii) The interaction of the Welfare State, the market and social oligopolisation may partly explain two facts which emerged towards the end of the period and which seem common to a number of developed countries :

- the gradual increase in the proportion of unemployment which is not cyclical;

- a persistence, and in some cases an intensification, of conflicts over distribution, which, coupled with increasing sensitivity of price expectations, were probably an important factor, at the end of the period, in the emergence of a type of inflation that had nothing to do with full utilisation of production potential.

Furthermore, certain authors have wondered whether in recent years there has not been in some developed countries a lasting downward trend in the propensity to invest, as much for institutional as for economic reasons (questioning of the legitimacy of profit, increased uncertainties), whereas net incremental capital/output ratios have probably risen since the beginning of the 1950s.

(viii) Most of the last quarter-century has been marked in the majority of developed countries by a broad internal consensus on a growth target expressed in terms of national income. But since 1968 this form of growth has been called into question and observers have been showing increasing interest in the emergence of new demands concerning attitudes to work, preferences as between income and other rewards, priorities as regards different goods or services, and the appearance of new concerns such as the environment. Could these demands be the expression of value changes likely to be adopted by the majority of a society, or do they portend a period of fragmentation during which large numbers of minorities fighting for different values will co-exist with the challenge to the legitimacy of authority?

There is one last lesson to be drawn from the past quarter-century: the homogeneity of the developed societies must not be overestimated. Admittedly, growth has narrowed the wide differences in life styles that existed just after the war and has brought the developed economies more into line as regards the ways in which they function. But there remain big cultural and institutional differences. In the economic field, for example, numerous authors have identified some of the respects in which the United States differs from Europe, itself by no means homogeneous moreover: in America the firm is essentially private, free pricing obtains, labour remains all told a variable factor, management responsibilities are not shared, profit is accepted as a goal; in Europe, governments intervene more, prices are often controlled, labour tends to be come a fixed factor, worker-participation in management is established or being demanded, the aim of business is more the social contribution than profit. As to Japan, certain aspects of the functioning of its economy have been the subject of many studies in recent years.

The two lines of evolution in the developing countries

The last quarter-century lends itself to two complementary readings as regards Third World trends :

- *first, the developing countries are becoming increasingly differentiated, with a wide disparity of growth rates;*
- *secondly, the developing countries present similarities engendered by relations with the developed world.*

For the Third World, having gained independence and now in the midst of a population explosion, the last quarter-century lends itself to two complementary readings which will crop up repeatedly throughout this report. Of these two readings, which respectively bring out the similarities and the differences between Third World countries, one is ascribable to a process of internationalisation originating in the OECD countries, the other to the differences in the internal dynamics of the developing countries as they respond to this process:

. On the one hand, the Third World, unlike the developed countries, is progressively becoming more differentiated and heterogeneous because of the cultural, social, economic and political particularities of its various societies and the ways in which they react to internal and external challenges, especially those resulting from Western influence. Some countries are in the process of becoming full industrial partners and already provide decent standards of living for their populations. Others are having difficulty in developing their agriculture and are seeing the numbers suffering from malnutrition increase from year to year. Thus, compared with the per capita growth rate of approximately 3% for the whole of the Third World from 1950 to 1975 (3.4% including China), South Korea, Taiwan and Iraq are now achieving more than 5% per year, whereas the rate is in the region of 1.5% for India, 0.7% for Bolivia, Chile and Ghana, and is even negative for Bangladesh, Rwanda, Burundi and Madagascar. Between 1960 and 1976 per capita income rose by 1.5% per year in the low-income LDCs, 3.7% in those with middle-range incomes and 5.7% in those with high incomes. South Korea, Brazil and Mexico are becoming industrial partners, and per capita incomes in the Third World range from $110 at 1974-76 prices in Bangladesh through $610 in Ivory Coast, $2,700 in Singapore, $6,300 in Libya to $15,500 in Kuwait. How will these trends develop? Will the disparities tend to grow or diminish? What strategies will consequently be open to the developed countries with regard to aid, the rules of international trade, transfer of technology, etc.?

. Yet at the same time the Third World is characterised by similarities engendered by relations with the developed world. Integrating the developing economies in the world economy has important consequences: foreign investment, attracted by the presence of raw materials or particular agricultural products, low-cost labour and the actual or potential scale of effective domestic demand; the birth of a relatively privileged working class; the co-existence of a modern sector and a traditional sector; conflicts between social groups with differing relations with the developed countries; rapid urbanisation, etc. This integration has effects which are beneficial and harmful at the same time. These economic and political similarities have given rise to a feeling of solidarity between élites, an effort to find a new ethic, a desire for cultural emancipation, the gradual establishment of a platform of common proposals which mark the beginnings of an ideological transformation of the Third World. Are we heading, as some people hope, towards the broad collective independence of a Third World which would henceforth severely restrict its relations with the West?

The developed countries are disconcerted by this dual reality as regards the developing world, and tend mistakenly to favour one or other of the two readings, depending on the circumstances. Both must be taken into account in the assumptions underlying the scenarios.

Similarly, whereas food production in the developing countries has increased by some 50% over the last 10-15 years, per capita consumption has risen by only 9% in all (ODC 1977), and with enormous disparities: negative growth from 1960 to 1970 in Black Africa and almost zero growth in the Near East and Far East.

Thus, while the world population was rising from 2.5 to 4 billion, the volume of what Keyfitz (1976) called the middle class was only growing from 200 to 500 million, i.e. less than the increase in number of those in a state of absolute poverty. In 1975 the latter amounted to 723 million: 386 million and 114 million in South and East Asia respectively, 114 million in Black Africa, 40 million in the Middle East and 39 million in Latin America.

The end of the twenty-five year period: temporary mishaps or a sign of new times

The present decade is a period of transition which can be interpreted equally in cyclical and in structural terms.

The structural changes generated by the events of the last quarter-century are now simultaneously impinging on the developed economies, on the relations between developed economies and on their relations with developing economies.

Fostered as from the early 1970s by rising inflation, declining returns on capital and the deterioration of the monetary system, the recession struck with full force in 1974 in the developed countries following the sudden sharp rise in the price of oil. The subsequent process of recovery has been slow and tentative, with some countries faring better than others, and in all but a very few cases it has not succeeded in reducing underemployment or eliminating inflation.

The McCracken report "Towards full employment and price stability" has described, by reference to statistical time series and macro-economic theory, how the conjunction of the monetary and fiscal policies pursued by the OECD countries from 1971 with the rise in energy costs in 1973 caused the recession to be as deep as it was. The analysis is unarguable, but if the frame of reference is broadened to political economy in its national and international aspects, it may be asked whether the mishaps were not brought about by deeper-reaching changes, whether the recession has not had structural causes which limit the use of policies to re-establish the mechanisms of growth or make those policies inadequate.

It would seem appropriate to extend the frame of reference on three levels which show up the transitional nature of the present decade.

The first of these contexts is that of the structural changes confronting the developed countries. Here the issues to be considered are long-term growth possibilities and the policies to be implemented during the transitional phase. These issues will be discussed in Part III of the report. The period from 1960 to 1972 was marked by a rapid expansion of trade in manufactured products and an intensive process of capital formation which became less and less compatible with Keynesian-type management of growth. The increasing magnitude of international demand relative to domestic demand reduced the effect of purely national policies of macro-economic regulation. At the same time it made it necessary for each country to strengthen its competitive position. The modernisation of many sectors and the growth of new, capital-intensive sectors raised the level of indebtedness in the economy and ate into firms' profits. Furthermore, by increasing labour productivity in certain sectors, this modernisation enabled real wages to advance. This, coupled with higher social insurance costs in some countries, accelerated the trend towards capital/labour substitution. This in turn contributed directly,and indirectly through supply/demand distortions, to the emergence of a structural unemployment, whilst inflation, stimulated by the rise in prices of certain raw materials and especially oil, strengthened its hold through the development of inflationary expectations and, in some countries, through a crumbling of the social consensus and difficulties regarding the distribution of added value between the primary factors of production, that is, capital and labour.

The second context is the change in relations between developed countries. The trends which had enabled Europe and Japan to experience rapid growth in a politico-economic complex in which the United States was the dominant influence were to result, from the end of the 1960s, in a world that had become more multipolar, especially in monetary, trade and technology matters. The decline in the relative weight of the American economy,the widely shifting pattern of exchange rates, the beginnings of separate monetary areas and increased competition on the markets of the developing countries testify to a situation in which the developed economies, although very interdependent, have probably become less complementary than in the past.

The third and final context is the change in relations between the developed world and the developing world. As we have seen, the rapid internationalisation of production and trade, a natural consequence of world growth, has precipitated the dual movement of collective solidarity and differentiation among the developing countries. The oil-exporting countries' realisation of their political ability to form a cartel and the negotiations for a scheme to guarantee commodity export earnings are both evidence of structural changes in bargaining power. The growing proportion of manufactures in the developing countries' exports and the increased percentage of private capital in financial flows to those countries are likewise changing the structure of economic relations, revealing more sharply than in the past the simultaneously contentious, competitive and solidary nature of relations between developed and developing countries.

Thus, the period of transition, the watershed between the last two quarters of this century and the starting point of our prospective analysis, can be interpreted simultaneously in cyclical terms and in structural terms. But the message of this period is not confined to the South and the West; the USSR and the Eastern European countries, major actors on the world stage, are notable at one and the same time for their military and political power, the extent of their raw material and energy resources, the vulnerability of their agriculture, the level of their imports of capital goods and the scale of the counterbalancing debts. Up until now, however, their impingement on West-South relations has been mainly political and military. Any analysis of the role they may play in the future depends to a large extent on the assumptions made concerning their internal development.

Lastly, even if it is an authentic developing country, China nevertheless differs from the others by virtue of its population, its homogeneity, its ideology and its form of government. Although for the moment it is of secondary importance in the economic field, will it be able to assume a major role by the end of the century?

The questions suggested by past trends will serve in choosing the dimensions characteristic of the scenarios for the future. First, however, it may be useful to say precisely how the scenarios should be understood.

2. WHY SCENARIOS?

The global scenarios constructed by INTERFUTURES are not forecasts but attempts to cast light on possible or plausible futures.

They are more than just sets of results of a model, since their construction simultaneously involves supporting studies of a quantitative and qualitative nature.

They can be used not only to investigate the changes induced by shifts in policies, but also to consider possible departures from the scenario sequences.

The global scenarios about to be described can give rise to a variety of misunderstandings concerning their role in prospective analysis, their meaning, and the way in which they have been constructed. Some basic clarification is therefore necessary for reading this report :

(a) The object of the scenarios is to provide, on the basis of explicit assumptions concerning a certain number of major trends, coherent macro-economic and geopolitical frameworks by means of which it is possible :

. to assess how issues impinge on one another in the context of the development patterns of OECD and Third World societies, the structure of relations between developed societies or between those societies and the developing countries. Examples of such repercussions are : the growth of the developed countries and their energy requirements, the economic disparities between developed countries and the effects of free trade, the extension of the international division of labour and socio-economic adjustments in the developed countries, etc.

. to explore the consequences of the adoption by the governments of the developed countries of strategic guidelines in areas such as energy, free trade, national and international redeployment of industry, aid for the Third World, foreign investment, etc.

Naturallly, INTERFUTURES has not reduced prospective analysis to the construction of scenarios alone. More direct and more sectoral approaches have been used simultaneously to examine and throw additional light on a variety of questions.

(b) The scenarios are attempts to describe the sequences and images up to the time-horizon 2000 which may emerge from a confrontation of the activities of the groups and institutions involved, (governments, social groups, large organisations) and from the uncertain effects of such a confrontation. They are not, therefore, forecasts so much as attempts to cast light on possible or plausible futures. However, some of their characteristics which stand up comparatively well in relation to the assumptions may naturally appear as forecasts. In addition, the various combinations of assumptions are not equally plausible.

In this sense, therefore, a scenario is not simply a set of results of a model. In putting it together use may be made of several models that supplement one another and supporting studies of a quantitative and qualitative nature.

Such studies, primarily sectoral, while keeping within the consistent frameworks provided by the scenarios, make it possible to assess the plausibility of the sets of assumptions that govern them.

(c) This being so, the working out of a scenario involves first the selection of major assumptions, then the calculation of global orders of magnitude with the help of various models (1), then the incorporation of elements borrowed from supporting studies (on energy, changes in production structures, trends in specific countries, etc.), then concentrates on analysing and criticising the sequential developments and the way in which they can be generated by decisions of the actors involved, and concludes by discussing the consistency and plausibility of the scenario.

It is then possible to use the scenario for policy analysis by investigating the changes induced by shifts in policies. Furthermore, investigation of the stresses to which the scenario's fulfilment is subject may reveal possible breaks, i.e. discontinuities after the appearance of which the trend departs from the scenario's assumptions.

Thus, the long-term scenarios constructed and used by INTERFUTURES have a significance different from that of most short- and medium-term scenarios (2).

The major difference lies in the principle of consistency, which does not and cannot have the same place in the two types of scenarios.

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(1) In particular the United Kingdom Department of the Environment's SARU model.

(2) Like those constructed by Working Party No.2 of the OECD's Economic Policy Committee.

. In the short- and medium-term scenarios, consistency is intrinsic to the assumptions and to the sequences. It is ensured for the period in question by the invariance of the model or of the conceptual frame of reference, so that the scenario's final image cannot, as such, bring the basic assumptions into question.

. In the long-term scenarios, on the other hand, the hypothesis of structural invariance has to be discarded and, as the time horizon recedes, the model reveals more accounting consistency than structural consistency. The sequential development of the scenario is seen to be subject to stresses, and it is the investigation of these stresses that suggests either certain policy shifts that would need to be made, or possible breaks, i.e. discontinuities after the appearance of which the trend departs from the scenario's assumptions.

3. THE RANGE OF THE SCENARIOS

The INTERFUTURES scenarios were built around a small number of dimensions. They were defined by way of combinations of significant assumptions concerning those dimensions.

In order to define scenarios which allow a reasonable investigation of the world of the possible, INTERFUTURES singles out a small number of dimensions, defined for each one the few contrasting assumptions which seemed most significant, and then endowed the various scenarios with different combinations of these main assumptions. But naturally, in order to make a scenario complete, further elements have to be added, as will be seen later concerning two important points. The advantage of this procedure lies in the thinking it gives rise to as regards the broad lines of future developments. The choice of assumptions was not governed by any normative intention at this descriptive stage.

The four dimensions chosen for the scenarios are...

The dimensions and the assumptions

The constituent dimensions of scenarios must fulfil two essential requirements : first, they must make it possible to investigate economic, social and political issues in their national and international implications; second, they must reflect the various possibilities of structural change as revealed by the analysis of past trends and of the different possible outcomes of the present period of transition. Four dimensions seem to be the absolute minimum, each of them incorporating contrasting assumptions.

... the nature of the relations likely to establish themselves between developed countries .....

(i) The first is the nature of the relations that may establish themselves between developed countries. Two assumptions are highly implausible. These are :

- global balanced interdependence as the consummate expression of the "liberal" concept of international economic relations. According to some authors, history would tend to show that the internationalisation of economic relations goes in inverse ratio to equality in the distribution of power among nations. A completely open and integrated system would need a regulator, a role that hitherto has been assumed by one dominant power. But the United States no longer has the virtual monopoly of power it had twenty-five years ago, and there is now no country to take over the role.

- Complete fragmentation, with the formation of autarkie and rival blocs - because the governments of the developed countries will undoubtedly not repeat the mistakes made during the decade preceding World War II.

That leaves two intermediate assumptions representing two kinds of possible outcome to the problems posed by the rebalancing of economic relations within the developed world.

(1) Within the group of advanced industrial societies, the trend of relations favours a transition to collegial management of the developed world's interests by the largest countries or by the United States, the EEC and Japan. This collegial management would ensure a relatively high degree of openness and some measure of economic stability.

(2) On the other hand, conflicts between advanced industrial societies in specific areas (for example, energy, raw materials, exports of capital goods, new technologies, the international monetary system) will lead to partial abandonment of free trade as regards sales and financial matters, with the United States, Japan and the EEC as competing poles.

These two assumptions implicitly presuppose the strengthening of Europe as a centre of power. However, a third assumption - that of growing tension between EEC countries as a result of the differing external pressures to which they will be subject - deserves consideration so that strategies can be found which will enable the EEC to overcome such difficulties.

... relations between advanced industrial societies and developing countries and relations between developing countries ....

(ii) The second dimension encompasses both relations between advanced industrial societies and developing countries and those within the Third World. The economic weight of the OECD area makes it difficult to consider these two types of relationship separately, as is shown by the extreme assumptions concerning the integration of the periphery with the centre and the collective self-reliance of the developing world. Here the emphasis is on possible changes in the explicit or implicit rules governing North-South relations.

Four assumptions cover the range of possibilities fairly adequately :

(1) gradual progress in North-South relations under the dual influence of periodic negotiations between the two groups, and an increase in economic exchanges which will differ from one group of Third World countries to another;

(2) more pronounced dissension between North and South, with the Third World countries making collective self-reliance a top priority. In other words, the majority of developing countries would adopt the positions recommended by the most fervent advocates of the "delinking" strategy; North-South trade would be reduced to a minimum and diplomatic conflicts between North and South would increase. For reasons which the analysis will reveal this is a highly improbable assumption, but one which is worth discussing in order better to understand the strategies available to the parties involved ;

(3) a regional break-up of the South caused by the formation of groups around emerging centres of power such as Mexico, Brazil, Algeria, Nigeria, Iran, Saudi Arabia, and Indonesia; preferential trade and investment relations would be established within these groups, but they would remain relatively open to the outside world;

(4) a break-up of the South in close conjunction with the developed countries, with the formation of large North-South areas inside which trade of all sorts would be given priority. Even if their policies were to diverge on important points, the various areas would nevertheless maintain substantial trade flows. Thus, Latin America could develop its relations with the United States, South-East and East Asia with Japan, and Africa with the European Economic Community.

.... the internal dynamics peculiar to the developed societies ....

(iii) The third dimension relates to the internal dynamics peculiar to the developed societies. The aim is to provide a description of changes in those societies which differ in depth and which result on the economic plane in social products differing in composition or volume (and therefore growth rate). This is a dimension that must be divided in two, given the current state of our ignorance of socio-cultural processes, since it has to show :

- the cultural phenomenon of the possible appearance of new values, shared to a greater or lesser extent by the community as a whole, with all the consequences that this may have for the way of life, the role of work, the nature of consumption, the way time and space are employed, the organisation of decision-making, institutions, etc., and more especially for the level and content of national income;

- and also the social phenomenon of the collective ability to effectively organise the growth of social production by innovating, redistributing production factors, accumulating capital and adapting institutions.

These are obviously interdependent phenomena which will be represented in practice by the simultaneous choice of an assumption concerning the growth of productivity and an assumption concerning changes in values.

Crossing the alternatives concerning growth rate and changes in values produces four assumptions.

(1) The developed societies will succeed in preserving a certain consensus regarding the dominant post-war values, give priority to economic growth in the traditional sense of the term and accept the adjustments that it entails. In these circumstances, productivity growth rates will develop uninterruptedly in line with past trends. This assumption of strong growth will make it possible to detect the obstacles which growth may encounter.

(2) The developed societies will not experience unanimously approved changes in values. While growth, full employment and price stability still represent deep-seated aspirations, conflicts between social groups will worsen and hold up adjustments. At the same time, (for reasons which are not solely domestic) economic growth will continue at a modest rate over a long period.

(3) Rapid value changes, particularly with regard to work and the composition of the goods and services demanded, will enable the developed societies to reestablish a consensus on the basis of slow growth and a different content of national income.

(4) The observations made in recent years suggest that the recession tended to curb the emergence of new demands, while the end of the period of growth had tended to encourage them. Whence the guess which constitutes the fourth assumption: the resumption of strong growth will facilitate a gradual change in values in the long-term; sustained growth will generate "new" growth.

.... the internal dynamics specific to the different groups of developing societies.

(iv) The fourth dimension naturally relates to the internal dynamics specific to the different groups of developing societies; the problem of choosing development strategies is well known to the élites of these countries, which are torn between the desire to reproduce the growth and consumption patterns of the developed world by means of industrialisation and integration in the world market, and the hope in inventing new forms of development which will satisfy the basic needs of the whole population more rapidly. Here again, it is by combining a rate of growth of national income and a development strategy assumption that an attempt will be made to identify the evolution of a group of Third World countries.

It is obvious, however, that the assumption made regarding the second dimension largely determines the choices that are possible with respect to the fourth: for example, in the first assumption the middle-income countries are logically going to opt for high growth, increased industrialisation and more foreign trade; in the second, the poorest countries will endeavour to frame strategies which give priority to the development of agriculture, fairer income distribution, etc. But in each of the four assumptions, growth rates and development strategies may differ from one group of countries to another.

Needless to say, the dimension-linked assumptions that have just been defined only represent possible lines of evolution, though by combining them it should be possible to lay the foundations of scenarios which will be consistent frameworks for reflection and analysis.

The reality will obviously be more complex and comprise elements of these various assumptions, but simplification - provided one is constantly aware of what one is doing - is a useful means of analysis.

Before specifying the choice of combinations of assumptions that define the scenarios studied by INTERFUTURES, it is necessary to consider two fundamental points which lie outside the foregoing dimensions. The first is the evolution of relative productivities in the developed world. The second is the impact of Eastern Europe.

The evolution of relative productivities

To differentiate the foregoing assumptions as between countries, it is necessary to consider the evolution of relative long-term productivities.

In order to reflect on policy choices, it is obviously necessary to differentiate between countries with regard to some of the foregoing assumptions. From the developed countries' point of view, none is more important than that concerning the long-term evolution of productivity. Let us assume that trade at world level becomes much more open, thus limiting the advantages that a country can derive from preferential access to natural resources. In the absence of a sound and commonly accepted theory on which to base conditional forecasts of productivity trends for each country, and in view of the importance of the dynamics of relative productivities in the evolution of competitive positions (as well as in that of international trade), two alternative possibilities may be envisaged. The first supposes catching up and convergence, the second divergence.

In the course of the last twenty-five years and up to the beginning of the recent recession, it was the United States which had the highest productivity per person employed. But in contrast, for the same period and also for the last expansion phase from 1963 to 1973, the productivity growth rate was lower in the United States than in any other industrialised country. The first alternative amounts to the assumption that over the next twenty-five years, the catching up process will continue, each country (except for the United States) experiencing a gradual decline in the rate of growth of its productivity until it reaches the level and trend of productivity in the United States. The date at which a country catches up will be correspondingly closer, the higher the level of its starting point and its productivity growth rate. It should be pointed out that the reference in terms of prices and exchange rates at the date on which the convergence process begins will affect the catching-up date, since although inflation and changing parities have no effect on the measurement of productivity trends in domestic terms, they will, on the other hand, cause substantial disparities in international comparisons of productivity. For example, if Japan's productivity in 1975 is measured in terms of 1970 prices and exchange rates, the result obtained is 38.2% of United States' productivity; but if 1975 prices and exchange rates are used in the calculation, the result is a figure of 52.6%. It should, however, be stressed that such a mechanism of catching up and convergence is of interest because it makes possible a study of the long-term consequences of a trend towards alignment of productivities in the developed countries as a whole, rather than because it gives reliable estimates of productivity levels at the end of the period.

On the other hand, we already know of a historical case where a country which had the highest productivity level was caught up and passed by another: when German productivity came close to British productivity in the 19th century, the British level did not turn out to be a ceiling and German productivity forged ahead without faltering. So it is interesting to investigate a possibility of divergence; for instance, Japanese and German productivity in particular could overtake United States' productivity between 1985 and 1990. This divergence would be in line with the argument put forward by M. Olson (1), according to which it is the institutional sclerosis resulting from the organisation of interest groups which gradually slows the growth rate. This sclerosis develops in a country during periods free from abrupt breaks in continuity. In this respect, Great Britain and the United States have had fewer upheavals during their recent history than Japan, Germany, Italy or France (2). Obviously there is nothing to prevent the various national societies from "aging" at different rates in this respect. This is the problem of structural adaptability in another form. To pursue the argument to its conclusion: the growth rates of the various developed countries, including the United States, would gradually slow down, but productivity levels would be just as widely spread at the end of the century as at present - though the order would be different. This is what shows up in the second alternative. Here again, this approach is justified because it makes possible a study of the consequences of tendencies to differentiation, and not because it provides reliable estimates of productivity (since reservations must be made about the measurements of relative productivity during the first year of the divergence process).

These two views of the future development of productivity attach most weight to internal factors. However, the assumptions adopted in connection with the first and second dimensions are bound to have a differential influence on productivity in the main developed areas, as the rest of the analysis will show.

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(1) M. Olson, The Political Economy of Comparative Growth Rates, op.cit.

(2) For M. Olson, Sweden does not constitute a counter-example in that interest group organisations encompass such a large share of national activities that they are having to attach importance to economic growth and the development of society as a whole.

Also, it is not impossible, either in the context of catching up or in that of divergence, that all developed societies, after experiencing a period of slow growth in per capita income up until the last decade of this century, will subsequently revert to more sustained growth thanks to the fourfold benefits resulting from the dissemination of major innovations, the gradual re-establishment of the social consensus in favour of new values, reduced uncertainty with regard to energy and the growing experience acquired by states in new forms of international co-operation. This would bear out a posteriori the theory supported by those who see the present period as a downswing phase in a Kondratieff cycle, prior to another upswing phase around the end of the century.

The impact of Eastern Europe

INTERFUTURES has not studied different assumptions as to the evolution of Eastern Europe, but has endeavoured to adopt plausible assumptions concerning growth rates in the area, the volume of East-West trade, East-South economic relations and the East's attitude to the North-South dialogue.

In view of the terms of reference of the project, the following elements are not so much an assessment of this complex set of questions as a description of the main assumptions adopted :

(1) Eastern Europe is often treated in this report as an entity, although during the last ten years the popular democracies of Eastern Europe have increasingly asserted their individuality vis-à-vis the USSR, notably in the way they manage their economies. Nevertheless, it seems reasonable to assume that this growing diversity will not, in the case of most countries, exceed the bounds compatible with the political cohesion of the area. It may, however, result in differing foreign trade patterns as regards both composition and volume.

(2) As regards the USSR, and contrary to the opinion frequently voiced during the 1960s that a "managerial revolution" was in progress, it now seems more probable that the immovability and structural rigidity of the internal political control will prevent radical changes in economic organisation. Consequently it is likely that the basic trends of the last few years as regards composition of national product will continue.

In the longer term, but that probably means the beginning of the 21st century, the increased relative weight within the USSR of the Moslem peoples of the republics of Central Asia and the Caucasus might generate servere internal tension which would oblige the central authority to rethink the management of the economy (1).

On the broader scale, many experts consider that it is in the next quarter-century that the USSR's relative power in the world will reach its peak. For the next decade, therefore, they fear an intensification of rivalry and a growth in the proportion of the developed countries' incomes allocated to defence expenditure.

(3) The rate of growth of Eastern Europe will probably slow down, particularly in view of the labour force trends. In fact, the 1976-80 plans already indicate slight decreases in rates by comparison with those of 1971-75 (with the exception of Bulgaria). INTERFUTURES has decided to keep - apart from a few slight differences - the rate

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(1) Cf. Hélène Carrère d'Encausse: "L'empire éclaté", Paris 1978.

of 5% which was adopted by the Economic Commission for Europe as a result of its recent studies. This rate would seem to be more or less a ceiling.

(4) Like East-South economic relations, East-West trade prospects will no doubt be influenced by the more general situation regarding political and military co-existence between East and West which has been mentioned.

But this trade also depends on three other factors : the rate of growth of the OECD countries, which has a strong influence on the level of their imports from the East, the attitude of the West's banking system to the Eastern countries' debts and the trade-offs the Eastern countries make between their levels of indebtedness and their capital equipment requirements for development plans. In all, provided there is no marked deterioration in East-West political relations during the next 15 years, it seems reasonable to assume that the present upward trend in trade and technology flows will continue at much the same pace, whilst capital flows will decrease after ten years or so. This evolution will, of course, be adapted to each scenario, but the basic assumption reflects the recognition, both in the OECD countries and within the CMEA, that the positive aspects of expanding economic relations outweigh the negative ones.

(5) With regard to energy, contradictory figures have been put forward for CMEA area trade: 24 to 50 million tonnes of petroleum exports in 1985 (Deutsches Institut für Wirtschaftsforschung 1977), 50 to 120 million tonnes of petroleum imports in 1975 (Russell, 1976), but the considerable importance of coal reserves in the USSR and Poland must be taken into account in the long-term. Consequently, INTERFUTURES has not ruled out the possibility that in some scenarios the Eastern countries may be net exporters of energy.

(6) Apart from political rivalry with the West, numerous factors are involved in East-South relations: unlike China, which emphasises the difference between rich and poor countries, the USSR stresses the dichotomy between socialist and capitalist countries; for their part, many developing countries put the East in the club of rich countries first and foremost, and reject the Soviet model of societal organisation; aid from the Eastern coutnries is small (0.03% of GNP in 1976, i.e. ten times less than that of the OECD countries), but geographically concentrated; the credits accompanying sales of capital goods are often granted against repayment in the form of raw materials, which is readily accepted by the developing countries; on the other hand, the East imports few industrial products from the South and, with the industrialisation of the Third World, the Eastern countries and the middle-income developing countries are going to become competitors on Western markets; lastly, arms sales by the USSR, Czechoslovakia and the GDR are an essential aspect of trade (US$ 2 to 4 billion per year for the USSR). In all, and except for the CMEA countries' oil requirements, the economic aspect of East-South relations would appear to be less important than the political and military aspects.

In these circumstances, the USSR may seek above all to establish and expand in the Third World a network of countries with which it would have entirely special relationships (Cuba, Vietnam, Ethiopia, Angola). This important aspect of the possible evolution of certain areas in the Third World has not been taken explicitly into account in the scenarios.

(7) A question often raised in the context of the North-South debate has been whether, in future, the East would be mainly part of the North, i.e.would be prepared to increase its aid, join certain international organisations such as the IMF and GATT, and oppose some of the Third World's demands. The trends are not obvious, and the assumption that the East will take up a position of its own concerning the North-South dialogue would seem the most realistic at present.

The Scenarios

The main scenarios investigated by INTERFUTURES (A, B1, B2, B3, C, D) are built around combinations of assumptions, shown in Table 20, chosen to characterise the futures in preparation in the present period of transition. But the picture of the possible futures given by these scenarios is incomplete if the different changes and breaks that may occur relative to some of the scenarios are not taken into account.

At a conceptual level, each scenario is defined by an identifiable and reasoned combination of assumptions. Of all the combinations possible, some appear more plausible than others, notably because of the interdependence of the dimensions. But a priori plausibility is not the only criterion. Some scenarios may be pertinent because they reveal the incompatibility of strategies pursued by protagonists in a situation of conflict, or because they develop trends which as yet are embryonic. In trying to reduce the combination of assumptions to a minimum, while at the same time keeping the range of futures envisaged open, INTERFUTURES investigated in greater or lesser detail the scenarios summarised in Table 20.

These scenarios may be defined as follows :

- Scenario A: Collegial management and conflicts in the developed countries; increased free trade; increasing Third World participation in world economic exchanges, but varying as between developing countries; sustained economic growth in the developed countries,but no rapid change in values. Relative productivities in OECD countries are assumed to converge.

- Scenarios B1, B2, B3 : Identical assumptions as to the nature of relations between developed countries, between developing countries and between the two groups. On the other hand, the developed economies will experience only moderate growth with differences according to the three alternative scenarios. In B1, value changes are rapid and there will be a consensus on the slowdown in growth, since it will be accompanied by a change in the content of "social output" (in the broadest sense of the term). In the other two alternatives, however, there is no significant, unanimously accepted change in values and the slowdown in growth is due more to structural adjustment difficulties at national and international level than to conscious resolve as in B1. Whereas the B2 alternative supposes convergence of relative productivities, B3 assumes divergence linked to social and institutional disparities between the various developed countries.

Table 20

Definition of the scenarios (1) (2)

Relations between developed countries	Collegial management				Partial abandonment of free trade between the poles
Internal dynamics of the developed societies	Consensus in favour of high growth	Rapid value changes and moderate growth	Conflicts between social groups and moderate growth		
Trend in relative productivities / North-South relations and relations between LDCs	Convergence			Divergence	
Large growth of North-South economic exchanges	A	B1	B2	B3	
Accentuation of divisions between North and South				C	
Partial fragmentation of the South following regional alignments with the developed country poles					D

(1) The fourth dimension concerning the internal dynamics of the various groups of developing societies has mainly been taken into account at the level of the regional analyses incorporated in the scenarios.

(2) To avoid having to repeat the letters, these scenarios are sometimes referred to in the text by the following code names :

A = high-growth scenario; B1 = new-growth scenario; B2 = convergent-moderate-growth scenario; B3 = divergent-moderate-growth scenario; C = North-South rift scenario; and D = protectionist scenario.

Useful though they may be, these code names do not satisfactorily sum up the assumptions underlying the scenarios.

. Scenario C: This was introduced in order to analyse the implications of a North-South confrontation. It supposes the implementation of "delinking" strategies by a majority of developing countries, collegial management by the countries of the North with increased liberalisation of their trade, slower growth without any change in values in those countries, and no convergence of productivities because the main OECD zones would be variously affected by the North-South break.

. Scenario D: Break-up of the developed-country group and mounting protectionism with the emergence of zones of influence centred around three poles, the United States, the European Economic Community and Japan. These zones will include regional groups (on a continental scale) of developing countries; trade and capital flows will develop preferentially within those zones. These assumptions are coupled with that of slower growth due in part to the destabilisation of trade flows. Non-convergence of productivities is due here to the differing impact of the break-up process on the main OECD zones.

Despite the diversity of these scenarios, the picture of the possible futures they propose is not complete. There are three different reasons for this :

. The future may be a composite of elements of the different scenarios; moreover, this is quite likely, as Part V of the report will show.

. Apart from the main scenarios, others could be outlined with the object of investigating pressures inside the EEC, value changes caused by growth, a resumption of high growth at the end of the century, much larger resource transfers from North to South (1), and so on.

. Finally, there are possibilities of changes and breaks which, relative to the sequential development of a scenario, would produce irreversible discontinuities. For example, in the high-growth scenario energy supply shortages resulting from the lack of access or constraints to the development of available resources could trigger a recession which would put paid to the evolution described in the scenario.

The issues revealed by the scenarios will emerge in the remainder of this report, particularly in Part V where the scenarios will be considered in detail. However, it is helpful to conclude this part of the report with a partial presentation of the scenarios to give orders of magnitude for the evolution of the world economy over the next 25 years, and to put it in some kind of perspective.

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(1) As in one of the scenarios presented by W. Leontief in his study for the United Nations (1977).

4. THE FUTURE IN ORDERS OF MAGNITUDE

A few orders of magnitude for the world economy at the end of the century will help to give a concise idea of the extent of the probable changes and the scale of the challenges with which the developed countries will be confronted.

The big advantage of the prospective approach is that the analysis of specific issues can be progressively built into consistent global frameworks by ensuring that the interdependence of issues is taken into account. The consistent frameworks are provided by the assumptions that govern the scenarios and their translation into macro-economic terms.

Nothing would be more at variance with the approach followed than to see the scenarios as exercises in projection; in INTERFUTURES they are essentially a tool of analysis. However, the robustness of certain end-results that follow from the assumptions makes it possible to put forward a few orders of magnitude for the world economy at the end of the century.

The point of these orders of magnitude is that they help to give a concise idea of the extent of the changes which the world economy will probably undergo in the last quarter of this century and, consequently, the scale of the challenges with which the developed societies will be confronted. If they are compared with the figures for the previous 25 years, it is possible to begin to assess the likelihood of continuance of certain major trends and the effect of changes in pace and direction of other trends. Constant reference to this framework makes it possible to give the analyses in the three subsequent parts of the report their true dimension on a world scale.

Table 21 describes, for the various scenarios, the trend in gross domestic product between 1975 and 2000 by major area and those areas' world output shares and per capita output in 1975 and 2000 (1).

In all the scenarios, the pattern of world income distribution changes considerably, the OECD area's share falling to about 50% and the Third World's reaching about 33%.

The first point to note in this table is the consistency of the estimates concerning the distribution of world product among the three regional aggregates constituted by the OECD area, Eastern Europe and the Third World. At the end-of-century horizon and no matter how contrasting the assumptions which govern the scenarios, the OECD countries' share of world product is somewhere within the region of 50% whilst the developing countries' share is approximately one-third, that of Eastern Europe varying between 16% and 20%. Admittedly, this consistency is partly attributable to the "cone" of the possible futures explored by the scenarios. However, beneath this apparent stability of shares at the level of major geographical and macro-economic aggregates, there is a wide diversity of situations and particularly trends in production and trade structures.

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(1) The population growth assumptions common to all the scenarios were given in Part I of the report (Table 2).

Table 21

Gross domestic product and per capita GDP, 1975-2000:
Comparison of estimates for scenarios A, B2, C and D

Scenario / Region	GDP (1970 US$ billion)					% of world GDP					Per capita GDP (1970 US$)				
	1975	2000				1975	2000				1975	2000			
		A	B2	C	D(3)		A	B2	C	D(3)		A	B2	C	D(3)
1. United States	1091.0	2418	1992	2139	2325	28.7	19	18	24	21	5132	9870	8130	7780	8450
2. Canada	103.3	262	211			2.7	2	2			4531	8730	7020		
3. Japan	257.5	1365	1095	477	1005	6.8	10	10	5	9	2371	10260	8230	3590	7560
4. CEE	705.3	2070	1588	1157	1477	18.5	16	14	13	14	2752	7960	6110	4450	5680
5. Western Europe other than EEC	150.8	647	562	293	460	4.0	5	5	3	4	1049	3950	3420	1790	2800
6. Australia and New Zealand	48.8	123	108	88	121	1.3	1	1	1	1	2568	5600	4910	4020	5490
OECD	2356.7	6885	5556	4154	5388	62.0	53	50	47	49	3044	8000	6470	4880	6270
7. Eastern Europe	607.8	2058	1962	1700	1962	15.9	16	18	20	18	1700	5330	5080	4730	5080
8. Latin America	235.5	1279	1137	964	1085	6.2	10	10	11	10	745	2300	2040	1730	1950
9. South Asia	82.6	280	250	215	220	2.2	2	2	2	2	101	210	184	148	160
10. South-East Asia	84.5	459	391	330	371	2.2	4	4	4	3	224	720	620	510	580
11. China	212.8	913	913	812	913	5.6	7	8	9	8	256	800	800	710	800
12. North Africa and Western Asia	150.3	816	645	560	645	3.9	6	6	6	6	845	2450	1940	1680	1940
13. Sub-Saharan Africa	49.7	208	145	121	198	1.3	2	1	1	2	164	380	266	223	360
Total 8-13	815.9	3955	3481	3002	3432	21.6	31	32	33	32	290	860	790	656	750
WORLD total	3802.3	12970	11057	8984	10836	100	100	100	100	100	960	2210	1920	1530	1850

Notes: (1) The regional breakdown by country is given in Part V

(2) South Africa is not counted among the regions 1 to 13; it is counted in the world total

(3) For the interpretation of the scenario D figures, see comments in text.

An example of this diversity of trends can be had by comparing the estimates in scenarios B2 and D. These two scenarios, which are very different in their assumptions as to the types of relations between developed countries and between developed and developing countries, present apparently similar images at the horizon 2000 with regard to the distribution of world product. However, if the horizon is taken only as far as 1990, comparison of the two scenários, as illustrated in Table 22, reveals significant differences, at any rate for the developed countries: the impact of protectionism as between the three major poles of the North occurs with full force in 1990, whereas ten years later it has been largely cushioned by adjustments.

Table 22

Gross domestic products and per capita GDP
in scenarios B2 and D at horizon 1990

	GDP (1970 US$ billion)		% of world GDP		Per capita GDP (US$ million)	
	1990		1990		1990	
Scenarios	B2	D	B2	D	B2	D
Regions						
1. North America	1737	1713	26	27	6760	6670
2. Japan	653	474	9	6	5280	3850
3. EEC	1200	1009	18	16	4620	3880
4. Western Europe (other than EEC)	361	380	5	6	2300	2420
5. Australia and New Zealand	80	83	1	1	4600	4690
OECD	4031	3659	59	56	4920	4430
6. Eastern Europe	1155	1171	17	18	2990	3030
7. Latin America	507	502	8	8	1110	1100
8. South Asia	141	141	2	2	120	120
9. South-East Asia	194	201	3	3	360	380
10. China	396	396	6	6	390	390
11. North Africa and Western Asia	232	238	3	4	870	890
12. Sub-Saharan Africa	74	76	1	1	170	180
Total 7-12	1544	1554	23	24	400	400
WORLD Total	6762	6416	100	100	1330	1260

Strong and converging growth in the developed countries

This scenario presents a world of nearly 6 billion people, with a gross product 3.4 times greater than in 1975 and energy consumption of 14.6 MMTOE. The Third World (not counting China) produces 17% of industrial output. The absolute number and the percentage of those with decent incomes will have greatly increased, but there will still be large numbers of people living in extreme poverty.

The increasing convergence of the developed countries in terms of productivity and patterns of production and consumption in Scenario A takes place in a context of strong growth. National incomes rise steeply in OECD countries until 1990 as economic slack is taken up and those with the lower productivities draw closer to the highest. They rise more moderately in the last decade, notably because of the demographic factor. In all, the OECD area's growth rate over 25 years is 4.3%. The EEC is very close to the average: 4.4%; the United States is naturally below: 3.2%, and Japan is very much above: 6.9%.

This growing homogeneity of the developed countries contrasts with increasing differentiation of the developing world: high growth rates in Latin America (7 to 8% per year over the period) and North Africa and the Middle East (in the region of 7% per year thanks to oil resources), and very varied rates in Asia and Sub-Saharan Africa (from 4.3% in the poor countries to 6.5 or 7% in the others).

The result? A world which is profoundly different but which retains features of the world we know:

. In 25 years, from 1975 to 2000, world income grows by a factor of 3.4 and per capita income by a factor of 2.3.

. With 15% of the world population, the OECD countries produce more than half of world income, but their share has decreased appreciably, in particular that of the United States (from 31 to 19%) and, to a lesser degree, that of the EEC (from 20 to 16%), whereas Japan's share has grown (from 6 to 10%).

. The developing countries now produce 30% of world output, compared with 18% in 1970. Latin America, China and the oil-producing countries are those mainly responsible for this transformation.

. With a per capita income of about $10,000 (1970 values), North America and Japan are ahead of the EEC and Eastern Europe, whilst at the other extreme, two areas remain extremely poor: South Asia and Sub-Saharan Africa. If, in spite of all the reservations on that score, per capita income is taken as the criterion, then Latin America, several Far East countries and, to a lesser degree, some Middle East countries are becoming part of the developed areas. China, finally, is reaching middle-income level.

In this world of nearly 6 billion people, the absolute number and the percentage of those with decent incomes will have increased very appreciably, but there will still be a very large number of people living in extreme poverty.

A few sectoral orders of magnitude will complete the picture.

. With regard to energy, given vigorous energy-saving policies, the high-growth scenario could take the level of world consumption to 14.6 MMTOE, with the OECD area accounting for about 48% of this total and the Third World for 31%.

. Industrial production would grow more slowly during the last quarter-century (about 4.7% per year at world level between 1975 and 2000). The developing countries' share (excluding China from both the numerator and the denominator), which remained for so long in the region of 7%, would grow spectacularly to reach about 17% by the year 2000. Admittedly, the target of 25% decided in Lima would not be reached, but the reallocation of industrial activities at world level would be well under way.

. This scenario is undeniably optimistic as regards growth of food production, given that in the Third World the rate of increase during the last quarter-century would be well above the rates recorded from 1961 to 1975 and close to the targets set by the UN for the second and third Development Decades.

. International trade would continue to expand, but slightly more slowly than in the past. Whereas world production would grow by a little over 5% a year, the volume of world trade would only increase by just over 7%, i.e. a ratio of 1.3/1.4 against 1.5 in the previous period. This would nevertheless be sufficient to increase economic interdependence: world trade would grow by a factor of 6 and, given the aggregations made, the ratio of volume world exports to world GDP would rise from 9% in 1970 to 13% in 2000. The effect on market shares would be very pronounced. The OECD area's share would decline, whilst that of the developing countries and the socialist countries would increase.

Of these major trends, the plausibility of which is investigated in the subsequent parts of the report, what remains in the images proposed by the other scenarios?

Moderate growth in the developed countries

Convergent moderate growth in the developed countries reduces to 2.9 the multiplying factor for world income between 1975 and 2000, since growth in the Third World is 10 to 15% less. The impact of the assumed divergence of productivities is delayed. It is not until after the end of the century that it would significantly alter trends in the various groups of OECD countries.

In the B2 scenario for convergent moderate growth, the rate of growth of the OECD area is no more than 3.4% over the period 1975-2000, i.e. 3.6% from 1975 to 1990 and 3.1% thereafter. For most of the countries in the area, growth is 30 to 40% less, which over 25 years gives a growth of 2.4% a year for the United States, 6.0% for Japan and 3.3% for the EEC.

Growth in the Third World is 10 to 15% less since, by comparison with the previous scenario, opportunities for exports to the developed countries are fewer (South-East Asia), demand for oil is much lower (OPEC countries) and aid is appreciably less (South Asia and Africa). From 1975 to 2000, world income now grows by a factor of 2.9 instead of 3.4. The per capita income range narrows slightly. The OECD area's share of world income decreases a little more, to the advantage of Eastern Europe and the Third World.

Energy consumption is appreciably lower at 13.2 MMTOE.

Industrial production grows, at world level, by about 4.4% per years, the slowdown relative to the previous scenario being more marked in the developed countries than in the Third World (China excluded), whose share of world industrial production is a little over 18%.

Annual growth of international trade is close to 6.5%, the relative prominence of the developing countries being apparent in trade in manufactures.

The B1 scenario for new growth assumes the same rates of growth as scenario B2 but a different content of growth. Its significance is therefore not demonstrable simply at the level of orders of magnitude.

If the assumption of productivity convergence in the developed countries is discarded and the more realistic assumption of divergence is adopted (scenario B3), macro-economic orders of magnitude are not significantly different at the end-of-the-century time horizon. With assumed annual growth rates between 1975 and 2000 of 2.4%, 6.6% and 3.2% for the United States, Japan and the EEC respectively, the only notable consequence is, of course, the increase in Japan's share of world product. In the 21st century, however, the consequences may be considerable, since after a long period of increasing homogeneity the present developed countries may become more and more differentiated. As the subsequent parts of this report will show, the interest of scenario B3 lies not so much in the quantified image it presents as in the questions it raises, and the following one in particular: how can the cohesion of the developed world be maintained when its main poles present widely differing capacities for structural adjustment, notably because of the differences in their social attitudes and institutional structures?

A rift between North and South

A rift between North and South would have very appreciable effects on the EEC and Japan.

It would slow down the South's growth and bring about profound changes in the economic structures and relations of the Third World countries.

Scenario C, which is extreme in its assumptions, makes it possible to investigate the consequences of a rift between North and South. Straight away it leads to speculation on the situation of the North African and Middle East oil-producing countries, torn between their loyalty to the South and the fact that for energy, food and finance they are bound by their interdependence with the North. The only likely conjecture is that they observe a certain neutrality, leaving an opening for trade with both North and South. This precarious neutrality would be accompanied by steeper oil price rises than in the other scenarios.

The rift itself, with the barriers of all kinds that would arise in consequence, would cause considerable upheavals in patterns of production and trade, and even consumption, both in the North and in the South. These upheavals are only faintly reflected in global orders of magnitude:

- Within the OECD area, where the growth rate at the end-of-century horizon would be of the order of 2.3%, the United States would be relatively little affected. The European Economic Community would be harder hit, and as for Japan, the loss of a large share of its foreign markets and the difficulties it would have in obtaining supplies of raw materials would mean that its growth rate would be about one-third of that of scenario A or two-thirds that of scenario B2. It would have to change the content of its national income very substantially.

. For the Third World, there would be a similar dispersion. The loosening of links with the developed countries, which would set off a period of recession to begin with, would then lead to a process of extensive socio-economic restructuring within the countries themselves and the establishment of a co-operative strategy designed to ensure the cohesion of the Third World. Overall growth during the period would be slightly over 5% and therefore very much reduced.

. By regions, growth in South-East Asia would be more than 25% lower than in the B scenarios, and growth in Latin America only 10 to 15% less, because of the adjustment possibilities offered by domestic market. South Asia, because it is less dependent on external trade, would suffer less in terms of global income, but in this region and in Sub-Saharan Africa the reduction in food aid and food imports would have adverse effects on nutrition. The conjunction of slower growth in the North with the North-South separation would compel the Third World to make great efforts in industrial development, and the share of the South (excluding China) in world industrial value added at the 2000 horizon would be approximately 22 to 23%.

This brief summary shows the extent to which some groups of countries in both North and South may be tempted to abandon strategies of confrontation which would have such adverse effects for them.

A fragmented world

The assumption of extension of protectionism goes with very much lower growth rates in the OECD area between 1975 and 1990, the different poles being variously affected. After 1990 growth might pick up again.

Scenario D, which assumes an extension of protectionism in a context of slow growth in the developed countries and with a tightening of preferential links between certain areas of North and South, makes it possible to investigate the possible consequences of an exacerbation of economic tension between the main poles of the OECD area.

Within this area, growth rates are lower than in the B scenarios, especially during the transitional period in which the structure of trade changes substantially. The estimates are as follows. For the periods 1975-2000 and 1975-1990: 3.3% and 1.8% respectively for the OECD area as a whole; 2.2% and 1.5% for the United States; 5.6% and 4.0% for Japan; 3.0% and 1.8% for the EEC. Thus, Japan is far less seriously affected than in scenario C because it is able to increase its trade with Asia as a whole. The EEC is worse hit, since its foreign trade is disrupted to a greater extent. Finally, for the United States, the impact is relatively light because of the size of its domestic market and the scenario's assumption of a development of US relations with Latin America.

The Third World would, on the whole, be less hard hit, given the scenario's assumption of preferential relations with certain areas of the North.

As to the Third World, it would be less affected by an extension of protectionism between the developed poles; its overall rate of growth would remain fairly close to the scenario B2 estimate, but there would be numerous changes in trade flows.

Naturally, in this scenario, growth of world trade continues at a slower pace than in the B scenarios, despite some catching-up at the end of the period: about 6% over the period 1975-2000. But it is in the pattern of trade that the changes are really appreciable. A marked slowdown in trade between OECD regions (growth of this trade is about 70% of the scenario B2 estimate) contrasts with a brisk acceleration, as from 1985-1990, in North-South trade within preferential zones.

The change in the structure of trade has a direct impact on the trend and distribution of industrial production. Compared with scenarios A and B2, the Third World's share rises, under the twofold influence of slower growth in the North and the extension of protectionism, to reach about 21%.

A picture in outline only

The orders of magnitude for the evolution of the world economy constitute no more than a frame of reference.

This summary presentation of the orders of magnitude linked with the scenarios first of all calls for caution on two counts :

. First, the description in macro-economic terms of a long-term trend is much less satisfactory than for a short-term trend, since it conceals, behind apparently similar orders of magnitude, structual transformations that differ significantly.

One must not forget the potential breaks which lurk beneath the surface of the scenarios and which indicate the vulnerability of present societies, nor the structural transformations in values, institutions and productive systems which constitute the basic fabric of change in the world economy.

. Second, the results produced by any global model used to quantify trends which incorporate deep structural changes have to be examined and utilised very carefully. For there are two extreme pitfalls to be avoided: an extrapolation that amplifies the outcomes of the assumptions by disregarding the numerous regulatory mechanisms that exist in societies; over-reliance on the re-balancing mechanisms built into the models, since the result may be to overestimate capacities for social adjustment in cases of structural change.

Next, a finding already reached by a great many prospective studies: major breaks apart, transitions in the world economy take place slowly, since major trends shift only gradually.

However, nothing would be more illusory than a reading of the proposed orders of magnitude which omitted the major uncertainties of the future. What, therefore, from the standpoint of the OECD, and additional to scenario C which itself constitutes a break, are the other possible breaks implicit in the range of scenarios?

. First, political rifts liable to emerge at three levels: revolutions in the Third World countries, and notably in the main oil- or commodity-producing countries; local conflicts between Third World countries, conflicts which might exacerbate a proliferation of nuclear arms; increased political and military rivalry between the United States and the USSR, with the Third World torn between the influences of East and West.

- Then, economic and social breaks, which may combine, moreover, with the political rifts: an inflationary recession triggered by an energy shortage, which would disrupt growth of the world economy and make the development of an A- or even B2- type scenario impossible; industrial redeployment which, because of the transitional unemployment created, would encounter such resistance in some of the developed countries that protectionism would develop cumulatively well beyond the compass of scenario D. These two breaks would be facilitated by increasing ungovernability of the developed democratic societies that would render them incapable of adjustment.

These possible breaks are an indication of just how vulnerable the present developing societies and the advanced industrial societies are. They show that in the great transition now under way, the risk of a major crisis does not derive solely from the difficulties encountered in specific fields like population, energy, agriculture and reallocation of industrial activities. It results first and foremost from a conjunction of the problems, which considerably increases the task of governments.

To understand this conjunction of problems, it is necessary, while keeping in mind the orders of magnitude for future trends, to analyse in depth the transformations that are linked with values, institutions, productive systems and trade between countries. Hopefully, in this way it may be possible to grasp the realities of the essential issues with which the governments of the developed countries will be confronted.

The first of these issues is the ability of the advanced industrial societies to adapt to structural changes and, over and above that ability, their long-term growth and employment prospects.

PART III : THE ADVANCED INDUSTRIAL SOCIETIES CONFRONTED WITH CHANGE

In analysing the prospects for the evolution of the advanced industrial societies, three complementary approaches will be used. These relate to :

- *changing values;*
- *macro-economic growth prospects;*
- *structural changes, with the pressures they generate and the rigidities they encounter.*

The synthesis of these three approaches will make it possible to discuss the strategies of advanced industrial societies confronted with change.

Logically, any analysis of the prospects for the evolution of the advanced industrial societies must be systematic, each element only taking on its full significance when related with the others. This part of the report attempts to achieve this, but in the interests of brevity it is restricted to three complementary approaches, each resulting from a fundamental question :

(i) Are the advanced industrial societies going to experience profound changes in the values of the majority of the population, changes likely to transform demands as to the volume and composition of the social product?

(ii) What are the long-term macro-economic prospects of the advanced industrial societies for growth, price stability and full employment?

(iii) Will the advanced industrial societies be capable of adapting their economic, social and political structures to the pressures generated by the profound changes the future will bring?

The three focal points of the analysis will therefore be the evolution of values, economic growth and structural changes. These three focal points are closely interdependent :

- Values play a fundamental role in economic growth, both because they determine the legitimacy of growth as a target, and also because they give rise to individual behaviour patterns which facilitate or curb this growth and shape its content. Conversely, by raising income levels and modifying the economic and social environment, growth can check or accelerate certain value changes.

- In its turn, the rate of economic growth largely determines structural changes; if the growth rate is high, it amplifies the changes but makes them easier to carry out, in particular by increasing all incomes at the individual level; if it is low, the changes induced are smaller, but harder to accept in that some groups find themselves worse off in absolute terms. Conversely, a society's capacity for adjustment to structural change is one of the factors which determine economic growth.

- Lastly, value changes are not generated spontaneously. Linked with the economic and social trend, they are promoted by social groups whose size and characteristics are the consequence of structural change, and so they can only be understood by reference to those groups. Conversely, values are at the root of behaviour patterns which facilitate or inhibit changes in structures (for example, by accepting or refusing mobility, by actively setting greater or lesser store by security, etc.).

Superimposed on this national network of interactions between the focal points, there are international influences (1), and it is from the conjunction of the two that the prospects for the evolution of the advanced industrial societies derive.

The plan of this part of the report is easy to deduce from these introductory remarks. After an analysis of changes in values comes a discussion of the macro-economic possibilities for growth. Then there will be a description of future pressures on the structures of advanced industrial societies, followed by a description of the rigidities which may tend to make adaptation difficult. After that, in a final section, we can deal with the interdependences between all these elements at the national and international level, and the main problems which are likely to confront the governments of the developed Western countries at national level.

This exercise produces three sets of findings :

. Looked upon as an instrument (not an objective), and supplemented by qualitative and quantitative actions, economic growth can not only help to provide partial solutions to major political and social problems such as unemployment, but can also create the resources needed to meet the new demands specific to democratic post-industrial societies.

. In the next 25 years, economic growth in the advanced industrial societies is possible since it will encounter neither physical limits nor an insufficiency of innovations. But the rate of this growth, which remains uncertain, will probably be slower than over the last 25 years, for both national and international socio-economic reasons.

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(1) The short-term interdependence of growth rates is one example.

. In order to cope with the uncertainties of the future, improve their growth prospects and take into account new demands, the advanced industrial societies will have some difficult trade-offs to make. They will have to display great structural adaptability in a context in which pressures for structural change will build up during a period when their ability to adapt will tend to decline.

1. THE EVOLUTION OF VALUES

Reflection on the long term must consider possible changes in values in the advanced industrial societies.

Although any reflection on the long-term trend of values is bound to be imperfect, it is still preferable to the silence maintained by too many future-oriented economic studies,since history has shown time and again that over a long period complex reciprocal relations exist between values, social structures and developments in the economy. Consequently a study of the problems of the advanced industrial societies confronted with change would risk overlooking the crucial factor if it did not consider the possible changes in values within those societies.

But the subject is a difficult one, and concepts differ widely from one author to another. In the circumstances, therefore, it is essential to begin by distinguishing between values and demands before going on to consider the direction and intensity of value changes and the socio-cultural panorama liable to result. In this way it will be possible to get a better idea of the probable consequences of these changes and their relationships with the other aspects of the evolution of the advanced industrial societies.

Values and demands

If values express underlying preferences, demands constitute the responses that derive from values and the environment.

Consequently, new demands may appear as the result of changes of differing depth: at one extreme, they simply

There would seem to be no other way to begin than by distinguishing between values, demands and behaviour patterns.

. Values express underlying preferences, such as those possessed by an individual as a result of his personality, the particular society in which he lives, and the interaction between the two. But also, because of social cohesion, they often constitute an archetype held desirable by a particular social group (1). They exist on several interdependent planes, expressing at the deeper levels a more or less conscious conception of the existential significance of human life and of relations between the individual and society, and emerging more superficially in trade-offs between dimensions such as power, prestige, security, comfort, escape, desire for action and so on.

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(1) In another form, "values will be taken to mean an individual's basic attitudes and fundamental orientations which play an intermediate role between the experience acquired in the past and the choices to be made in the present, simplifying the problems to be dealt with and guiding behaviour by supplying justifications and incentives for action". Commission of the European Communities, Euro-Barometer, No.8, page 18

express a reaction to changes in the environment; at the other, they stem from changes in conceptions of the significance of man's existence.

. Demands, on the other hand, are the responses of individuals and groups to the interaction of their values and the environment in all its forms. This is the textbook concept, but for present purposes it needs to be expanded in three directions :

(1) Between the demand for goods and services provided by the market or by the Welfare State and the ultimate demand for the entities that reflect preferences there is a whole chain of intermediate demands, as between demand for transport for formal visits to the family and demand for transport for less formal human contacts.

This first observation is fundamental to the distinction between the formal sector of the economy consisting of enterprises and the Welfare State, and the informal sector comprising individuals, households and local communities, a sector that transforms into ultimate demands the goods and services obtained from the formal sector.

(2) Demands amount, of course, to more than seeking an income in exchange for work or getting goods and services in exchange for money. There are many people who expect more than just an income from their work: they expect exchanges with others, utilisation of their intellectual abilities, the exercise of power. A simple purchase as described by economic science is always more complex in practice. Finally, there are a great many demands which lie right outside the sphere of monetary exchanges.

(3) Finally, the environment is not bound solely by the constraints of the price system and income. It brings into play a great many other constraints that characterise the human condition, like time, the organisation of society, regulations, etc.

With this wider view of demands it becomes necessary to think again about the way a great many traditional problems are formulated. The choice of how many hours an individual works is not the result of a trade-off between an income and work on the one hand, and leisure on the other. In fact the trade-off is between the various ways in which time is used and the different kinds of satisfaction, direct or indirect, that can be obtained thereby.

. As to behaviour patterns, they are, of course, the reflection of demands in a particular situation.

All of this means that changes in values and demands occur at different depths.

- At one extreme, that is the most superficial level, changes occur only in demand addressed to the formal sector. Thus, changes in income levels and distribution, in existing technologies or in relative price levels are reflected in changes in the demand for goods and services in the traditional sense.

- At a deeper level, there are the changes which affect the relationships between ultimate demands and demands addressed to the formal sector, like those which alter the significance of certain forms of consumption for the individual.

- Going deeper still, it is the priorities as between the dimensions assigned to the values - say, between security and power - which change.

- Finally, at the other extreme, changes may come about which bear on the significance of human existence, like the changes which in the past, have often accompanied the birth of the great religions.

Changes at any of these levels may induce new demands, but the deeper their origin, the more the whole functioning of society is brought into question. Logically, the new demands that are due to value changes should be differentiated from those that are not. Yet at the same time, some consider that the satisfaction of new demands reacts in turn on the underlying values to the point of making those demands indispensable in a changed environment. Therefore, the point of concern in the analysis that follows is the depth of the changes in demands and values within the advanced industrial societies.

- In scenarios A, B2 and B3, for example, changes in demands originate only at the most superficial levels.

- In the B1 scenario, on the other hand, the changes go at least as far as the priorities attached to the different values and possibly as far as the meaning of human existence.

But to pass from the individual to society it is necessary to take account of the cultural differences between developed societies, cleavages of pre-existing values within some of them, the role of the social groups and the diversity of individuals themselves.

But in shifting the analysis from the individual to society, a number of important points must be made.

. The developed countries do not form a homogeneous whole in respect of values: Japan has its own cultural tradition and there are many differences between North America and Western Europe, which itself is heterogeneous, for example in regard to the degree of importance attached to security.

. In the last quarter of a century these societies have known a wide consensus in favour of economic growth, but this has in no way prevented some of them from experiencing wide cleavages of values, such as that between Marxist and liberal thinking.

. While they have their own dynamics, values are to a large degree the expression of significant social groups whose emergence and volume are conditioned by the overall evolution of the economy. Values cannot, therefore, be discussed in the absolute as though they had no link with the rest of the economic and social context.

. But individuals themselves are not monoliths. Though they may hold minority values on some issues, on others they may subscribe to distinctly majority values.

So it is necessary to be cautious in interpreting what can be said about the value changes that have apparently occurred in the developing societies during the last few decades.

Value changes in the developed societies: direction and intensity

The economic trend of rising average incomes over the last quarter of a century has probably been the major contributing factor to changes in demands and values in the developed societies, changes that differ as to their depth and as to the importance of the groups which subscribe to them.

Analysis of socio-cultural trends is still at a relatively embryonic stage, in particular because of the lack of standardised quantitative data for sufficiently long time series. Nevertheless, it seems to be established that the dynamics of values, far from developing in an arbitrary fashion, in fact obey three complementary rules : (1) changes in priorities favour the values corresponding to those of an individual's requirements that are least satisfactorily met by the economic and political environment; (2) the impact of this environment, and therefore openness to new values, is most perceptible during the formative years, the phase of the life cycle in which receptiveness is greatest; (3) the emergence of the new values which impregnate the youngest age groups becomes apparent when one generation is in the process of being replaced by the next (Inglehart, 1977).

Since World War II, and more particularly since the beginning of the 1960s, the OECD Member countries have all undeniably experienced very much higher rates of economic growth than in their respective pasts, a great expansion of education, an improvement in health standards and a complete absence of any tangible external threat. It is reasonable to assume, like Inglehart, that the generations which reached adulthood during this altogether exceptional period will have fairly different value priorities from those of their elders who grew up in quite a different context. These changes could be augmented by the ignorance of the past demonstrated by the younger generations, what some authors have called absence of memory. (Chaunu, 1977).

During these decisive years the coverage of consumption requirements improved greatly, and it is reasonable to presume that in the future they will be considered less essential than other objectives less strongly felt at the onset, but which are reinforced by the rise in educational standards. The latter include, to use the classic terminology of psychologist Abraham Maslow, the need to belong, self-esteem and fulfilment - particularly in work. Similar changes are apparent regarding the role of women in society. Child-bearing now represents only a small proportion of their life's duration and they now have time for other pursuits than looking after the home. It is quite conceivable that they will increasingly wish to take an active part in the life of society and notably in working life, even if this means that time budgets are extremely strained. One can understand, in short, that some people are finding that they are having to pay an increasingly heavy price to obtain satisfactions they feel are their natural due and are therefore radically questioning the whole organisation of society, since they consider it responsible for their situation.

The analysis of this subject reveals the roles of the different groups comprising women, young people, professional persons - journalists, researchers, teachers - and within these categories more radical and more restricted groups. It suggests a set of four basic hypotheses. These are confirmed on the whole by the exposition that follows but naturally have to be adapted to each country :

- Changes occur at different depths. Whereas in some cases they are very probably confined to demands, in others they affect values themselves.

- The evolution of values is probably fairly general in the developed societies, but it is only for certain minority groups that it brings into question the meaning of human existence accepted by the majority. As to that majority, it is itself heterogeneous, since some of its members may, on certain issues, adopt values that are quite different from those of the rest.

- In this context, each individual may find himself harder put to weld the values underlying his demands into a consistent whole.

- These value changes are, of course, additional to any earlier cleavages that persist.

(a) An indisputable socio-cultural change, ushered in by the youngest sections of the population.

Recent surveys reveal a marked contrast between generations in their value priorities.

The ideal approach would of course be to compare and contrast international surveys carried out in comparable conceptual frameworks from the inter-war period up to the present, but this is obviously not possible. Instead we shall use a number of surveys from the early 1970s which set out to classify the values of the respondents by means of a set of questions relating to two types of public policy objectives. One type concerned material and economic security considerations, and the other non-economic priorities (1). The two ranges of attitudes underlying each type of choice were termed - somewhat debatably, in our opinion - "Materialist" and "Post-Materialist". It is difficult to avoid using this terminology because it was used for the original interpretation of the surveys.

A comparison of the choices made by the different age groups during the period 1970-1973 shows a sharp inter-generation contrast in value priorities. For the older generations (aged 65 or over, and therefore born well before World War I), "Materialist" options are much more common than "Post-Materialist" options. These proportions change spectacularly when one comes to the replies of those in the 20-29 age group, almost all of whom were born after 1945.

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(1) In the fullest questionnaire, distributed in 1973 and comprising twelve items, the objectives to be chosen broke down as follows (Inglehart, 1977).

"Post Materialist requirements
- Town improvements/nature conservancy
- A society in which ideas count for more than money
- Protection of freedom of speech
- A less impersonal society
- Increased participation in the living and working environment
- Increased participation at political level.

"Materialist" requirements
- A powerful national defence
- Crime control
- Law and order
- Stability of the economy
- Growth of GDP
- Control of rising prices

Table 23

Value priorities in the developed countries

Generations aged 65 and over	Western Europe	USA	Japan
"Materialist"	between 37% (GB) and 62% (Germany)	40%	58%
"Post-Materialist"	between 6% (Switzerland and 1% (Germany)	7%	2.5%
Aged 20-29 (1)			
"Materialist"	between 18% (Belgium) and 27% (GB)	24%	33%
"Post-Materialist"	between 23% and 11% (same countries)	17%	11.5%

(1) In the case of Japan, the women's replies are largely responsible for checking the growth of the "Post-Materialist" category among the younger generations (the rate of 11.5% breaks down into 18% for men and 6 for women.

But these data reveal more than the outburst of "Post-Materialist" values in the young generations. They also show us that, for large portions of the population, priorities reflect a blend of the two kinds of values and it is, in fact, the nature of that blend which changes with the generations.

(b) A movement whose scale varies according to country and social group

The scale of the movement varies from country to country but the "silent revolution" in the scales of values is centred in particular on the middle classes.

Given the contrasts which are a feature of the economic and political history of each country since the 1930s, it is reasonable to suppose that, far from being uniform, the inter-generation gaps in values will be correspondingly wider where the post-1945 decades introduce a more significant break from the past. In fact, it is found that the overall dispersion of replies between the extreme age brackets is approximately twice as great in Germany and France as in the United States and, above all, Great Britain. It is, moreover, this great variability of the generation gap which suggests that the different attitudes of the younger generations with regard to values do not simply reflect the habitual evolution of attitudes during an individual's life cycle, but must indicate a change of a more structural nature.

Another notable feature of what Inglehart describes as a "silent revolution" is the fact that within a given age bracket, the "Post-Materialist" orientation will become more marked as the level of wealth rises and the distance from so-called "essential increases" widens. Whether one takes as an indicator the socio-occupational group of the respondent (or of his/her father), or the level of education, it is found that the percentage of "Post-Materialists" increases with advance up the social scale. Nonetheless in the early 1970s it was only among university graduates aged between 16 and 44 that "Materialist" values were in a clear minority. It is true that changes in attitudes with regard to patriotic feeling, sex, religion, work, money, etc. extend well beyond the campus, as the surveys regularly carried out by Daniel Yankelovich have shown in the case of the United States. The fact remains that the "silent revolution" in the advanced industrial societies' scales of values is centred in particular on the middle classes, which is remarkable when one considers that the latter have in the past always been the upholders of the so-called traditional values.

(c) A phenomenon whose development, at least in its extreme form, is uncertain

In recent years the percentage of "Post-Materialists" has not been growing. This is not inconsistent with the possibly heterogeneous adoption of certain "Post-Materialist" values by the majority.

The emergence of different priorities in value systems is still by no means on the scale it assumed in the eyes of the general public as a result of the student agitation of the 1960s and the literature for and against the protest movement. If one only considers those who have completely embraced "Post-Materialist" priorities,surveys carried out in 1972-1973 before the "crisis" indicated that the proportion of "Post-Materialists" ranged from a minimum of 5% for Japan to a maximum of 14% for Belgium (Germany and Great Britain 8%, France and the USA 12%). In addition, the political and economic conditions prevailing during the formative years of a given cohort appear to be important for socio-cultural dynamism. This prompts questions as to the stability of the orders of priority adopted by the rising generations; might not slower economic growth and more conflictual inter-State relations undo, at least partially, what the peace and prosperity of the 1960s has established? The post-1973 surveys, confined to EEC Member States (Euro-Barometer Nos. 6,7 and 8) indicate an overall decline, which is admittedly moderate in absolute terms but fairly significant in view of the small numbers involved. The possibility cannot therefore be ruled out that, while the rise of "Post-Materialism" may continue through its own momentum as the generations in which it first appeared grow older, it could subsequently lose impetus if the general economic context were to remain sluggish for a long time.

A possible socio-cultural panorama

An accurate assessment of the socio-cultural panorama resulting from this "silent revolution" would require an empirically verifiable theory of the link between values, objective constraints and revealed demands. For want of such a theory, the best that can be done is to give a broad outline of what could be the content of "Post-Materialist" expectations and their relations with the values of the majority. In this case, the most likely scenario for the advanced industrial societies would be one of fragmented societies.

(a) "Post-Materialist" expectations, which cover widely varying fields, involve a desire to be liberated and to establish roots

"Post-Materialism" is characterised by demands for liberation and establishment of roots. The content of these demands may be seen in an extreme form in certain minority groups within the "Post-Materialist" fold.

The content of the new emerging values is often summed up by saying that it consists of putting the "quality of life" before material well-being. While it is true that those who subscribe to the "Post-Materialist" cultural model do not want more but want something different, their expectations can hardly be summed up in terms of the simplistic alternative just mentioned because in fact they cover a large number of heterogeneous areas. Thus, the surveys on attitudes carried out regularly since September 1973 at the instigation of the Commission of the European Communities bring out certain characteristics peculiar to the "Post-Materialist" group, such as :

- a propensity to attribute poverty to structural causes rather than to the particularities of the individuals concerned;
- a more favourable attitude towards ecological movements;
- a preference for the non-monetary aspects of the trade or profession exercised;
- a more receptive attitude towards pollution control than towards measures to combat drug addiction.

Behind this list of attitudes, which could be extended almost ad infinitum, one can discern a small number of stable, constituent principles which in fact boil down to two key concepts: liberation and the establishment of roots.

Within the "Post-Materialist" fold certain very minority groups express in extreme form these demands for liberation and establishment of roots. In the first place, they demand that individuals should be freed from moral taboos, hierarchical constraints, or norms, and also that all "peripheral" groups should be emancipated from the "centre", whether this concerns relations between capital cities and the provinces, dominant languages and dialects, colonised peoples and imperialism, children and parents, women and men, the natural environment and technology and so on. Establishing roots is the positive side of this negation. Its radical expression is the setting-up of all the "liberated" groups in independent communities which maintain only minimal contacts with the outside world - and in particular with what remains of the "centre". It advocates in any case that decision-making should as far as possible be transferred to these communities, on condition that this does not impede the egalitarian policies designed to wipe out past injustices.

(b) The values of the "middle majority" incorporate elements of "Post-Materialism" but rejects its extreme forms

The middle majority accepts "Post-Materialist" values in a subdued and heterogeneous manner, arriving at some sort of compromise with the more traditional values. But the image of this majority lacks definition, since sub-groups that adhere to it in the essentials may break away on specific issues.

Despite its diversity, the "Post-Materialist" category shows some degree of consistency, as does the diametrically opposed "Materialist" category. However, it would be wrong to think that the rest of the population, which has made "mixed" choices between the two extremes - and which, it should be pointed out, accounts (except in Belgium) for between 40 and 60% of the total population of the countries surveyed - is just an amorphous mass. In fact, the "silent revolution" referred to by Inglehart was accompanied by another equally profound social change which received inordinate publicity in the 1950s during the controversies over the "end of ideologies", but was eclipsed just as undeservedly by the dynamism of the protest movements. This was the arrival on the scene of the social group that the Anglo-Saxon sociologists call the "middle majority" or "middle mass" (Wilensky, 1975). This "middle majority", which in some respects is not very homogeneous, is distinguished by the fact that its members reject any extreme allegiance and always choose intermediate positions when they have to situate themselves on a rich-poor or right-left scale. Having risen socially thanks to economic growth, they are visibly more concerned with the absolute rise in their standard of living, by comparison with the past, than with their relative position vis-à-vis groups which are socially better placed. This does not mean that they are impervious to all "Post-Materialist" values; they accept them in a subdued and heterogeneous manner, arriving at some sort of compromise with the more traditional values. It is probable, for example, that foreign travel and home ownership - two of the leading aspirations of the French of today (J. Arbois, 1978) - are for them a manner of incorporating into their everyday lives the twofold motivation of freedom and taking root which, for others, assumes the form of ecological militancy or the return to the land.

But the middle majority parts company with the extreme forms of "Post-Materialism" on one specific point: it rejects the *use of violence* as a method of political action. Attitude surveys show quite distinctly that in the United States and Europe (and probably Japan too) between two-thirds and three-quarters of the population want a policy of gradual reform, while at least 20% of respondents opt for "defending society against subversion". Significantly, in this latter group middle-class persons are outnumbered by manual workers.

The complexity of the middle majority's attitudes is revealed in its growing opposition to heavier compulsory taxation. A "Post-Materialist" hostility towards big bureaucracies and a "Materialist" rejection of egalitarianism along with a preference for individual patterns of consumption seem to combine to produce this reaction.

The image of this "middle majority" lacks definition, since sub-groups that adhere to it in the essentials may break away sharply on specific issues and a great many individuals have difficulty in welding their values into a consistent whole.

In the absence of conclusive surveys, a certain number of convergent phenomena are indicative, such as the changes underlying the switch in the political balance in Sweden in 1976, the results of the referendum in California (June 1978) on the rise in real estate taxes, and the prevalence of tax avoidance and illicit work. They suggest that in the eyes of that part of the population which is neither very well off, nor very deprived, increases in public service charges must not be detrimental to increases in take-home pay, particularly if the tax system favours categories not considered by the middle majority to be a social priority.

Some probable consequences : towards fragmented societies

The evolution of values in the developed societies might produce a second fragmentation, additional to the one represented by the continuation of past tendencies and the cleavages of the post-war period, which particularly concerns national income distribution.

The political pressure kindled by "Post-Materialist" groups is new because of the forms of action they use and the claims they press, and it is going to confront governments with specific problems of arbitration which will be all the harder to resolve in that the "middle majority" will be voicing expectations that combine new and traditional values.

Already it is apparent that even the strictly individual responses to changes in priorities carry external effects which the public authorities cannot afford to ignore. They will be even less able to do so if socio-cultural changes give rise to a pressing demand for collective solutions. This would seem to be the case as regards the "Post-Materialist" cultural movement whose supporters, to use Hirschman's language, may be said to be visibly inclined to use *voice* rather than *exit*.

The second fragmentation would be caused by the emergence in the middle majority or on its fringe, of numerous minorities each with its own set of differing and to some extent volatile demands.

The content of the demands of the "Post-Materialist" type also represents a clear break with the past. In this respect, public opinion and the mass media have concentrated above all on the incompatibility between the new aspirations for greater qualitative well-being and the old-style quantitative growth. This incompatibility is real, but the economic implications of "Post-Materialist" values are more equivocal than commonly thought. Undoubtedly the deep-seated opposition to "big" technology - particularly electro-nuclear - the aggressive anti-elitism and the desire to protect the natural environment at any cost can result in the adoption of economically inefficient solutions whose non-commercial advantages are hardly perceptible. To be objective, however, it is necessary to consider certain economically positive aspects, such as diminishing fascination with monetary earnings or a more sceptical attitude towards the expansion of public services, which could help to ease inflationary pressures or facilitate the implementation of a moderate policy of redistribution.

It may be precisely over the order of non-economic objectives that the problems of arbitration will prove most delicate, for many of the "Post-Materialist" demands seek to obtain for very varied groups recognition of a number of rights of access or action which cannot as a rule be granted or refused other than en bloc, since they are by definition collective rules of the game which apply to all. Whence the very considerable difficulty in finding for these "non-negotiable differences" (R.Rose, 1978) the compromise solutions to which conflicts over the sharing of infinitely divisible resources lend themselves, such as those over money, and which are current practice in the normal political life of a democracy.

All told, this inevitably tentative analysis leads one to conjecture that the developed democratic societies, instead of experiencing a renewed consensus on the dominant values of the past quarter-century (as in scenario A) or a rapid espousal of new values as perceived by most of the "Post-Materialist" minority (as in scenario B1), might be marked by a double fragmentation of values.

- The first fragmentation is represented by the continuation of past tendencies and the cleavages of the post-war period, the search for equality by some and the defence of relative positions by others, generating constant conflicts over the distribution of national income. This struggle, which in institutional terms intensifies the process of social oligopolisation with its trade associations, unions and pressure groups, obliges the State to increase its interventions and develop its bureaucracy.

The intensity of this first fragmentation seems to differ significantly as between North America, Japan and the various countries of Western Europe.

- The second fragmentation would be caused by an evolution of values which produces the emergence, either in the middle majority or on its fringe, of numerous minorities each with its own set of differing and to some extent volatile demands. With the diversity of life styles come discretionary forms of social conduct (D. Bell). To put this in different terms, the need to be free and to take root corresponds to demands for decentralisation and participation. Taken up by the whole of the population as the cultural level rises, these demands seek implementation at the institutional level: in the factory and the enterprise, in local life and in the region. They come up against the bureaucracies, which come to terms with them - with the object of self-preservation.

In this way the difficulties of governing the developed democratic societies would grow, whilst spontaneous trends would strengthen the role of political negotiations as compared with the market.

These complex trends in values will have consequences for the structures of the advanced industrial societies: on the allocation of time, on the organisation of production, on the development of an informal sector of production within households and the emergence, though on a small scale, of a "third system" between the market and the Welfare State

What might be the consequences of these complex trends in values for the structures of the advanced industrial societies? We shall mention just a few of them here :

. In the future, the advanced industrial societies will be defined as much by the allocation of time of individuals as by the allocation of incomes. The work time/leisure time dichotomy will finally lose what has become an outdated significance and it will be the uses to which time is put that characterise life styles. In particular, major changes can be expected in the use of time by young people, women and elderly persons. Hence the interest of more studies on time budgets.

. The search for complex satisfactions in work will change the aspirations and requirements underlying job applications and will make the distinction between employed and non-employed persons much less clear-cut. By the same token, the duration of working life might be much more graduated.

. The needs for decentralisation and participation expressed by staff will oblige firms and public services to alter the mode of functioning of their production units. Insofar as technology permits, preference will be given to units with a work force that remains within certain size limits. In big organisations, however, the development of employee-participation might prove quite compatible with an extension of bureaucratic procedures, contrary to what some people hope.

. Demands for the protection of the environment, i.e. for the reduction of physical and social degradation, should intensify, thus strengthening resistance to big technologies.

. With the shortening of time spent working outside the home, there might be a development within households of an informal sector transforming goods into services and substituting for purchased private services. The existence of this informal sector may provide individuals with the source of satisfactions that will make up for the relatively lower incomes due to the reduction in time worked in the formal sector. Similarly, this future might see the tentative emergence of a third system of social organisation additional to the market and administrative systems and characterised by non-market forms of private self-organisation (such a system is particularly conceivable for social and cultural activities) (1).

There are several kinds of relationship between value changes and economic growth. However, the quest for strong economic growth will continue to be one of the favoured means of governments to meet the demands of the population.

There are four different kinds of relationships between value changes and economic growth.

. First, the evolution of values does not seem to be independent of the pace of growth. A few indicators suggest that the 1975 recession and the slow growth that followed acted as a curb on value changes, whereas the strong growth of the 1960s contributed to their development. If the pattern were to be the same in the future, scenario A would produce a society in which "Post-Materialist" values were predominant - the continuation of growth progressively diminishing its own significance - whilst scenario B1 would have less chance of becoming established. Consequently, from the standpoint of values, scenarios B2 and B3 would be the most internally consistent since they reflect the essence of a fragmented society. If, nevertheless, economic growth were to be even slower than in those scenarios - which would plunge the advanced industrial societies into grave difficulties - more drastic socio-cultural changes would not be inconceivable. A return to past values or the acceptance of new ones? Which would it be?

. Secondly, by bringing society's objectives into question, the new values are a reminder that economic growth may have no significance except as an instrument and cannot be pursued unless it responds to the material and spiritual needs of society.

Since, in all likelihood, the development of these values will not eliminate, at least in the medium term, the aspirations of the majority for full employment, greater material well-being and a more egalitarian distribution of incomes and property, the quest for strong economic growth will continue to be, in the next quarter-century, one of the favoured means by which governments try to meet the demands of the population.

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(1) Cf. Commission of the European Communities, Report by the Think Tank, New Characteristics of Socio-Economic Development, "A Project for Europe", Brussels, December 1977.

. A third kind arises because the new values will lead to some modification of the content of this growth, or to measures to prevent any repercussions that may be thought harmful.

. Finally, although it is connected with growth, change in values also depends on the whole social development process, on education, on urbanisation, on the life span, etc. Except in the case of a rupture, it will proceed even with low growth. Scenario B1 implies a society which would be able to meet peoples' qualitative aspirations without rapid growth. Therefore it can gradually emerge from B2 or B3, but this will require time and many institutional changes.

In any event, this analysis of socio-cultural changes shows the importance of reflecting on the macro-economic prospects for growth, even though it reveals the limits of such reflection vis-à-vis the goals of society as a whole.

2. THE PROSPECTS FOR MACRO-ECONOMIC GROWTH

Besides the problem of physical scarcity of resources and its effect on growth, another prior question arises as to whether there may be technological limits to growth. The answer to this question, too, would seem to be essentially in the negative.

Having put these two prior questions, we can consider the macro-economic evolution of the developed societies from four standpoints :

- *long-term growth;*
- *the prospects for rapid economic growth;*
- *the varied prospects for moderate growth;*
- *the interaction of growth with values and structural adaptability.*

The economic system is not self-contained; an obvious point, but vital to a study of its long-term development. It maintains complex relations with the realm of human values; it uses exogenous human and material resources and discharges wastes into the biosphere; and it employs techniques based on knowledge obtained largely outside its domain. Hence any study of macro-economic growth raises two preliminary questions :

- Is global physical scarcity of resources likely to limit the growth of the developed economies in the next quarter of a century?

- Are we on the eve of a slowdown in innovation which could permanently reduce advances in productivity in these economies?

Part I of this report has already given a qualified negative answer to the first question by showing that physical shortages will not of themselves prevent a return to rates of growth comparable to those of the past quarter-century. As regards energy, the main problem is how to bring about a smooth transition from oil to new sources; there should be enough industrial raw materials to satisfy potential demand. Progress in agriculture in the Third World could keep pace with population growth, at least until the end of the century. It seems unlikely that major problems of the physical environment, and notably climate, will affect macro-economic growth in the next two decades. Meanwhile manpower may become one of the most plentiful resources in the world; even taking just the developed OECD countries into consideration, it will not constitute a constraint on their growth, at least until 1990.

The second question, however, has not yet been broached. It will be discussed as an introduction to this Section and will likewise be given an essentially negative answer.

We may now ask in what form the question of long-term growth arises from a strictly macro-economic point of view and then discuss the prospects for rapid economic growth. Discovery of the obstacles liable to impede such growth will lead to a study of the various prospects for moderate growth and to a clearer picture of the interaction between macro-economic growth, changing values and structural adaptability.

The technological frontiers of growth

A substantial slowdown of growth due to lack of technical innovation seems unlikely. Such obstacles as might arise would result from the interaction between science, technology and society.

Up to the end of the century a substantial slowdown of growth due to lack of technical innovation seems unlikely. There is a lapse of time between a scientific discovery and the spread of the resulting innovations throughout the economic and social systems, which is seldom less than 20 years for major developments. Thus the main technologies likely to have an important impact between now and the end of the century are already known and their introduction may lead to major advances in productivity, even if in the short term there is still no real breakthrough or if potential demand is slow to materialise.

Nor does it seem that in the longer term the capacity for scientific discovery or even technological potential as such will set limits to growth.

The obstacles, if any, will be due to the interaction between science, technology and society :

- Continued slower growth would reduce long-term R&D activities in favour of those yielding quicker returns. Consequently, the objective of reducing production costs for a given volume of output would lead more to improvements in existing processes than to the introduction of new products or processes.

- Scientific and technological development in recent years has involved mobilising ever larger financial, physical and human resources. However, when growth is slow or uncertain, such resources become scarcer, whilst long-term profitability seems less assured, at least for private investors.

- For a technological breakthrough to materialise it must not come up against resistance from society; it must be in response to already existing demands or must give rise to new demands.

. Hence for innovation the limits would be socio-economic rather than strictly scientific or technical. Accordingly, the concern of governments should be to maintain a political, economic and social climate favourable to research, technological development and innovation, to encourage the private sectors to pursue these activities by reducing obstacles and increasing incentives, and finally to provide direct or indirect support for long-term fundamental research.

Four main paths of technological development now seem likely to have an influence on the organisation and evolution of the advanced industrial societies :

- electronics;
- exploitation of ocean resources;
- new energy forms;
- bio-industry.

What then are the major technological developments which may be expected to have a marked influence on the organisation and development of advanced industrial societies? Four of the main ones deserve close examination. In the probable chronological order in which their applications will be developed, they are as follows :

- electronics, including the revolution in micro-processors;
- the exploitation of energy and mining resources in the oceans;
- the development of new forms of energy;
- bio-industry.

(1) Electronics and micro-processors

Electronics and micro-processors - a decisive qualitative leap forward with considerable potential consequences for economic and social life in the developed countries.

A decisive qualitative leap forward. The appearance of micro-processors in the mid-seventies may have three major simultaneous effects. Revolutionise the conditions for automating many industries (especially by removing many technical obstacles to the decentralised management of production processes). Transform patterns of consumption (through the spread of many kinds of computerised products and services). Change the position and organisation of the tertiary sector in the main industrialised countries (in particular through the emergence of teleprocessing, combination of telecommunications and data processing).

On the other hand there is the fear that for about ten years the negative effects on employment following the widespread use of micro-processors may outweigh the positive effects. The latter will follow from the emergence of a demand for new consumer goods connected with electronics, but this demand may at first clash with deep-rooted social habits and not be general enough to form a large profitable market in the near future.

In the longer term, however, the electronics revolution will change the face of advanced industrial societies. Production, transmission and processing of the most varied information will be at the heart of economic activity and social life, and the cost of hardware will often be negligible compared with the time required for designing software, for collecting and updating data, and for users to adopt the new systems. These developments contain the seeds of a completely new accounting technique and also of a reorganised society, not because teleprocessing will dictate the distribution of power in society, but because it will change the technical context in which choices are made: the choice of freedom and decentralisation, and the choice of participation and, more generally, the choice of life styles. So it is to be expected that issues like respect for private information, particularly that of a personal nature, proliferation of data banks and absence of monopoly in the electronics industry will continue to be hotly debated.

(2) Exploitation of energy and mining resources in the oceans

The future for exploitation of ocean energy and mining resources will depend less on technology than on policy decisions concerning the law of the sea.

Need it be recalled that the ocean bed contains considerable reserves of hydrocarbons, and of metals which are generally in the form of polymetallic nodules but in a few areas like the Red Sea also appear as concentrates in hot brine?

Hydrocarbons. For technological and economic reasons, the ocean bed has only been systematically explored to a sea-depth of 200 metres, but by 1976 the oil extracted from this zone amounted already to nearly 24% of the output of the non-socialist world. In the next decade a systematic exploration of all the continental shelves down to a sea-depth of 300 metres is likely to be undertaken on a large scale. Whether after 1990 exploration will be extended to the continental terraces and sea-beds themselves is an open question and will depend less on technological constraints than on estimated economic returns.

Off-shore mining. Research is already being done into recovery techniques for mining on an industrial scale. These techniques are a vital factor in the profitability of factory ships, because an average deposit contains from five to ten thousand tonnes per km2 and each mining unit must have a capacity of from one to three million tonnes per year depending on the metal content and polymetallic nature of the nodules. North American firms are in the lead, but a group of Japanese metal-working and engineering firms has just launched an important programme directly aimed at industrial operations, while Germany and France have mainly experimental programmes.

On the whole, the future of these activities - which may be launched on a commercial basis around 1985 - will depend less on technology than on policy decisions concerning the law of the sea, a field in which the clashes of interests are in proportion to the gigantic economic potential of ocean resources. The range of possible solutions is very wide :

- At one extreme a new intergovernmental organisation could be set up and given the exclusive right to exploit the seabed; the big mining enterprises would sell their services to it.

- At the other extreme the mining rights for all international waters would be divided up between the States bordering on them.

- Between these two extremes are several possibilities:
  - dividing the seabed into zones worked by the intergovernmental organisation and zones worked by the major mining enterprises;
  - giving mining licences to multinationals for specific zones, maximum tonnages and limited periods;
  - allowing multinational enterprises to exploit the seabed with a minimum of controls.

The choice depends on how interdependent relationships are managed (see Part V) and not on technology (1).

(3) Development of new forms of energy

Several decades of technological revolutions in the field of energy are in prospect.

A vast technical effort is in progress to enable mankind to reduce its dependence on oil. The two huge technological ventures under way, namely nuclear fusion and solar energy, are fully the equal of the great adventures of the past, but they should not be allowed to detract from more modest but undeniably valuable efforts, such as the exploitation of geothermal energy or of the biomass. In the field of primary energy conversion into secondary energy, the 21st century may also see large-scale conversion of coal or bituminous shale into liquid fuels.

Let us take the example of solar energy. It is being studied along four main avenues: solar space heating by flat solar captors, an already developed technology (progress is connected with the absorbent materials whose thermic performance keeps improving while the cost decreases); the production of industrial temperatures (between 100 and 500 degrees) with new technologies still in the experimental stage; the production of electricity by solar power stations (heliostats) with arrays of parabolic mirrors; and the production of electricity from photovoltaic batteries. It may thus be considered that the development of solar energy is possible within the time span mentioned in Part I, provided that there is a sustained R&D effort in connection with materials (captors), methods of control (obtaining maximum radiation) and optical systems. Even so, one thing is clear: quite apart from the problems of safety of nuclear power stations and radioactive waste disposal, the change in energy sources will have much less of an impact on everyday life than the surge in electronics.

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(1) The environmental protection issues raised by the exploitation of ocean energy and mineral resources were mentioned in Part I of the report.

(4) Bio-industry

According to some, biology will have as much impact on industry in the 21st century as chemistry and physics did in the 20th. The number of possible applications is growing.

The spectacular development of fundamental knowledge in biology in the last twenty years lends increasing cogency to the question of how this knowledge might be applied to the majority of human activities, especially industrial activities. Some are already saying that biology will have as great an impact on industry in the twenty-first century as chemistry and physics did in the twentieth.

Meanwhile there are increasing signs of production processes in which the activity of living micro-organisms might partly or wholly replace physico-chemical processes, and of new products connected with the utilisation of certain properties of micro-organisms. This confidence in the future of bio-industry should be tempered with some caution regarding the time scale or profitability of this or that application.

Let us list and briefly illustrate some of the fields concerned :

Energy. In the field of bio-fuels there are already technologies based on the activity of methane-producing bacteria (in China there are about 4.7 million methane-generating plants). After some simple improvements they could be used widely, especially in the Third World.

Animal feed. At present the profitability of protein feeds produced by the action of yeasts on hydrocarbons is not very secure, but it might become so. However, this procedure may be exposed to strong competition from the extensive cultivation of "energy-producing" algae, fermentation of which gives methane and food proteins. On the other hand, their use as human food seems much less promising for reasons of price and cultural habits.

Agriculture. The rapid development of ecological pesticides seems imminent. In the last decade of the century part of the market for nitrogen fertiliser might be replaced by bacteria capable of fixing nitrogen and transforming it directly into ammonia. These bacteria will be introduced either into plants or into the soil.

Chemistry. There should be important progress in biological catalysts in the near future.

Pharmacy. The use of living systems to make more specific medicines with less side-effects will profoundly change the structure of this sector and, all other things being equal, will reduce the volume of pharmaceutical production.

Lastly we would mention the improvement of animal and vegetable characteristics by genetic engineering.

The emergence of the bio-industry will naturally amplify the problems of controlling the risks which it presents for the eco-sphere (uncontrolled development of bacterial strains; emergence and spread of genetic mutations, etc.).

This review of the advances in technology warrants a study of growth centred on socio-economic factors.

This rapid review of the major technological developments under way tells us three things :

- It endorses earlier findings that science and technology will play an increasing role in the future of the advanced industrial societies. Hence, government policies in this area will assume increasing importance. The importance of the economic and social side-effects of certain major technological innovations argues in favour of a development of our understanding of these phenomena by case studies, using the systems approach.

- It shows that technological progress is not losing momentum. At worst, it will be slowed down by the smaller volume of discretionary resources in low-growth societies. Conversely, bigger R&D investment would probably have a favourable impact on growth rates in the longer run.

- It warrants an examination of growth which, over and above the preconditions as to resource limits and technology frontiers, centres on socio-economic factors. Consequently, a natural guideline, at least to begin with, is macro-economic theory.

The problem of long-term growth

Though potential economic growth rates may not have suddenly declined, the question remains as to whether this potential growth will be achieved in the long term. Hence the point of discussing the constraints on a resumption of high growth and then the different prospects associated with moderate growth.

The foregoing would suggest that potential economic growth rates have not suddenly declined. But this does not mean that potential growth will materialise. So, as a first step we shall investigate whether there are macro-economic constraints which make a return to strong and sustained growth unlikely in the OECD area, and we shall point out some significant difficulties. We shall then consider various patterns of moderate growth and find that new conflicts arise and many problems are aggravated. But whether it be high growth or moderate growth, one thing is certain: growth itself is the result of the worldwide interaction between what governments do and what micro-economic entities do. So it is necessary to consider the institutional machinery - market and government - which controls resource allocation at national and international level and reconciles changing supply with changing demand, without forgetting the incentives for transactors to innovate, invest and participate in policy deliberation.

It should be pointed out that the discussion which follows does not claim to be an exact description of the present economic situation and its causes. In 1976 the OECD Secretariat published a medium-term scenario (1) and the McCracken Report (2) examined in detail an interpretation of recent economic history, adding policy recommendations for the next few years. In the present report, however, which deals with the long-term outlook, the wealth of contemporary events must be put aside so as to focus discussion on a few themes and isolate the significant trends and essential determinants of growth. Hence the inevitability of choices which will make the present exercise incomplete for those seeking an account of current economic conditions.

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(1) OECD. A Growth Scenario to 1980, Supplement to Economic Outlook, July 1976.

(2) Towards Full Employment and Price Stability. A report to OECD by a group of experts, June 1977.

The prospects for rapid growth

Examination of the high-growth scenario - an average annual growth of gross domestic product of 4.3% for the OECD countries from 1975 to 2000 - leads one to ask:

- *First, within the bounds of a macro-economic analysis is it possible to find policies capable of producing a high-growth path?*
- *Second, behind the economic developments are there deeper-lying factors, both national and international, which might account for changes in the conditions for growth?*

At the centre of the McCracken Report and of the most recent discussions in the OECD on the medium-term outlook is the conviction that rapid growth once begun could be continued. Resources would be adequate, the labour force would grow fast enough and innovation and technical progress would advance at sustained rates, at least where there was heavy investment.

Leaving aside reflationary policies, one would find all along the path of sustained rapid growth the well-known circular pattern of economic forces : a strong demand would generate incentives to invest, while productivity would increase; then with high investment rates and steep rises in productivity, earnings would increase sufficiently to keep demand buoyant. The rise in productivity would bring down unit labour costs and inflationary tendencies would weaken. As regards balance of payments problems, they would not be aggravated by the rapid growth, leaving aside the price of oil and its impact on the balance of trade. Indeed in recent decades nothing has changed in the logic of production relationships or in the recycling of earnings to suggest that once rapid growth and full employment have been achieved, they could not be maintained.

Where, then, are the difficulties? At the national level there are expectations and aspirations borne of experience and recollection; responses from economic transactors to the policies necessary for ensuring the transition to rapid growth. At the international level there are governments' difficulties in co-ordinating their policies and there are problems with the transition to new forms of energy.

Let us consider what might be the sequence of developments for rapid growth.

Taking a short- and medium-term view, the McCracken Report has already suggested a recovery path which would lead the OECD economies back to rapid growth. What does it say? "The immediate causes of the severe problems of 1971-75 can largely be understood in terms of conventional economic analysis .... the most important feature (of recent history) was an unusual bunching of unfortunate disturbances unlikely to be repeated on the same scale, the impact of which was compounded by some avoidable errors in economic policy" (1). Hence the Report considered that "a period of sustained increase in real incomes and employment was a reasonable expectation, with real incomes increasing on average by 5.5% per year for the whole of the OECD area during the period 1976-80". Taking this view, the years from 1968 to 1975 would be seen as a period of growing tensions leading to a deep recession, after which growth might start again, perhaps a little more slowly, but giving at least satisfactory levels of employment and economic activity.

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(1) OECD, Towards Full Employment and Price Stability, op.cit.

This is not what has happened. Consequently the events since the McCracken Report was written demand an analysis of the obstacles which can slow down growth. Scenario A for rapid growth is an excellent crystal ball for this purpose.

The assumptions underlying this scenario imply a 4.3% annual growth of real product in the OECD area between 1975 and 2000, with a return to full employment by around 1990. The growth rate will be higher between 1975-1990 than this quarter-century average (4.9%) as spare capacity is absorbed, and lower between 1990 and 2000 (3.4%) because the labour force will be growing more slowly and the convergence of productivity rates will make itself felt.

Table 24 gives the essentials of this scenario over the period 1975-2000 for some OECD countries. Its left-hand column shows the population of working age (15 to 64 years). In most countries its growth slows down dramatically. On the basis of these figures together with assumptions regarding participation rates, and presuming that migratory flows remain fairly steady, it is possible to estimate the trend in the labour force.

Combined with the trend of the labour force, the increase in productivity will then determine the increase in potential output. The table shows that despite increasingly similar productivity rates the historical pattern will continue, with rates in Europe around 4.5% (1 point more for Italy and 1 point less for the United Kingdom), almost twice that figure in Japan and about half of it in the United States. Progressive economic recovery until cyclical unemployment is eliminated then gives the growth rates for GDP in the last three columns of the table. The assumption that in the first part of the quarter-century productivity rates will catch up to past trends probably overestimates growth rates in the European countries.

In this scenario what is the significance of the reduction in growth rates towards the end of the century? It mainly reflects the slower growth of the labour force and to a lesser extent the convergence of productivity rates. Moreover, as participation rates increase, so income per capita increases more slowly than output per person employed. However, it may be asked whether the increase in productivity is not liable to slow down more abruptly, because there will be less demand stimulus from population growth and there will be less investment and few opportunities for innovation in technology and organisation.

Table 24

Growth rate of population of working age, productivity and GDP in some OECD countries (Scenario A)

	Growth rate of population of working age		Average growth rate of productivity 1975/2000 (1)	Rate of structural unemployment (2)	Annual growth rate of GDP		
	1975/90	1990/2000			1975/90	1990/2000	1975/2000
Germany	0.3	-0.8	4.1	1.3	4.9	1.8	3.7
Australia	1.6	1.6	3.1	2.0	4.5	3.0	3.8
Belgium	0.4	0.0	3.9	3.5	4.8	3.6	4.3
Canada	1.4	1.0	2.3	5.2	4.0	3.3	3.7
France	0.7	0.0	4.1	2.1	5.4	3.5	4.6
Italy	0.6	0.0	5.5	2.5	7.1	4.0	5.9
Japan	0.9	0.2	6.2	0.9	7.6	5.8	6.9
New Zealand	1.4	1.0	3.0	2.0	4.0	1.5	3.0
Netherlands	0.3	0.0	4.1	1.3	5.1	2.5	4.1
United Kingdom	0.3	0.0	3.3	1.6	3.9	3.5	3.7
Sweden	0.1	0.0	3.2	1.0	3.5	3.1	3.4
USA	0.9	0.6	2.2(3)	4.9	3.6	2.6	3.2
Total					4.9	3.4	4.3

(1) These rates are for productivity per worker per year. They assume both a catch-up to past trends and convergence of the various countries' productivity growth rates on the United States long-term rate, assumed exogenously as 1.84% per year (figure quoted by the Council of Economic Advisers) (see Part V of the report).

(2) INTERFUTURES estimates

(3) This figure exceeds 1.84% because of the catch-up to the pre-recession trend level of productivity.

It is interesting at this point to make a comparison with a speculative medium term scenario for high growth put forward in 1978 by a group of experts from OECD countries, even though after further analysis it was rejected as too optimistic. For the seven main OECD countries that scenario gives a collective growth rate of 4.7% between 1978 and 1985 (Germany 4.5%, France 5.7%, Italy 5.7%, United Kingdom 3.5%, Canada 5.4%, Japan 6.5%, United States 3.9%). This represents a growth rate of 4.6% between 1975 and 1985 (close to the 4.9% for 1975-1990 in Scenario A). The scenario assumes a return to full employment in 1985 when the unemployment rates for the main countries would be as follows : Canada 4.7%, France 2.5%, Germany 2.5%, Italy 3%, Japan 1.75%, United Kingdom 2.5%, USA 4.5%. As to productivity growth rates over the same period, they would be: Canada 2.5%, France 3.9%, Germany 3.8%, Italy 3.3%, Japan 5%, United Kingdom 2.2%, USA 1.6%. Since this scenario is for the medium-term, it takes account of the effective conditions for resumption of growth and therefore does not assume a catch-up to past trends in productivity growth. Taking the short-term constraints into account, it gives higher figures for the United States and lower ones for the EEC.

Two initial conclusions can be drawn from scenario A :

- The return to full employment will be difficult in Europe, where for a decade there may still be a gap between potential and real output. It should be easier in the United States where the rate of frictional unemployment seems much higher, whereas in Japan the productivity growth observed in the past is unlikely to be maintained at the outset.

- The scenario only seems possible (see Part V) if energy elasticities, i.e. the ratio of energy demand to GDP growth, are about .7 in the future (as they have been in several OECD countries over the past 5 years) compared with the 1.0 prevailing before 1973. Likewise the United States would have to cover at least a substantial proportion of its energy requirements from its own resources. Consequently, if energy policies were not vigorous enough, rapid growth might be obstructed - especially because of foreign trade constraints - by energy shortages which might start an inflationary recession in the late eighties.

Apart from these conclusions, the scenario raises two different questions:

. Keeping initially within the context of traditional macro-economic analysis, is it possible in the present circumstances to find policies capable of leading to rapid growth?

. Beneath the economic causes and effects, are there deeper-lying social and political factors, national or international, which may account for the change in conditions for growth?

(a) Macro-economic constraints

There may be three major economic constraints on rapid growth:

- *insufficient investment;*
- *emergence of balance of payments deficits;*
- *renewed inflation.*

In the economist's parlance there may be three major constraints on rapid growth :

- insufficient investment causing bottlenecks long before full employment is achieved;

- the appearance of balance of payments deficits which would make it necessary to curb growth in order to limit imports;

- a revival of inflation due first to the reaction of wages and prices to the stimuli of government policies and subsequently to the build-up of inflationary expectations.

Each of these constraints deserves consideration.

The rates of investment implied by high growth are liable to prove unattainable without sustained policy action and perhaps altogether unattainable.

Investment and the demand for capital. Despite a relative abundance of savings, private investment has been remarkably low in OECD countries in recent years. This situation is clearly due to insufficient demand, but its origin has yet to be convincingly explained. Several factors, varying considerably in their impact from country to country, seem to have been at work.

(i) The large volume of excess capacity. Whereas average capacity utilisation ratios in manufacturing industry in the 10-year period from 1964 to 1973 were 85.4 in the United States, 95.9 in Japan and 86.3 in Germany, they had fallen to 83.0, 85.4 and 81.7 respectively by the third quarter of 1977. According to the figures available, the latter rates are the lowest since 1960 in Japan, France and the United Kingdom, but in other countries they are roughly comparable to the rates in previous recessions. The situation is made worse, however, by the fact that in recent years investment has gone into labour-saving projects.

(ii) The fall in profit rates (1). In manufacturing industry up to 1970, the fall was significant only in Germany and the United Kingdom and to a lesser extent in Sweden and the United States (2); no significant trend is perceptible in the other countries except Japan, where profit rates increased right up to the moment when the oil crisis produced a sharp downturn. In industry as a whole, investment became less profitable in most countries, but the figures available are for real profitability, whereas what governs investment is expected profitability and this may have been less.

(iii) Increased risks due to the uncertainty of the economic environment (inflation, energy prices and variable exchange rates) and to the adoption of new legislation in favour of social objectives. The risks associated with changed rules, new regulations, tax and levy systems and, above all, political risks, probably explain why there was so little investment in the raw materials industries.

Be that as it may, in scenario A, a projection of the amounts of investment necessary for achieving the assumed growth shows that:

- in most OECD countries the rates of investment during the period of recovery will have to be higher throughout the economy than in the period 1975-1978, especially if account is taken of higher capital/output ratios.
- in all OECD countries investment rates in industry will have to be much higher, even after 1990, than those observed from 1975 to 1978.

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(1) Based on figures for gross returns, but there would not seem to be any divergence between the trneds for gross and net returns.

(2) But according to Malkiel (1978) there should be no long-term decline in the United States.

The discussions in Working Party No.2 suggest that in view of the recent shortage of investment there would have to be a most improbable surge in investment to achieve the scenario for recovery. This surge would of course be followed by a drop to the long-term equilibrium level. Thus, the rates of investment implied by rapid growth may prove impossible without sustained policy action and perhaps may be simply unattainable. In any case, one of the conditions for restoring investment is to restore expected returns.

But the discussion of investment cannot be confined to volume alone. In almost all the industrialised countries, the growth of apparent labour productivity from new investment has hardly been sufficient to offset the fall in apparent productivity of capital, which shows that the actual nature of investment is in question. According to a recent report by the Forecasting Directorate of the French Ministry for the Economy, both technical (increased constraints connected with protection of the environment, expansion of investment in the service sector), institutional (inadequacy of training systems) and social (search for new forms of work organisation) limitations are diminishing the positive effect of investment on productivity.

In the present and foreseeable state of international cooperation, many governments, uncertain over rates of expansion in other countries, are being obliged to reduce their growth rates in order to meet balance of payments constraints.

The balance of payments constraint. The need to balance foreign payments may seriously limit the prospects for growth. In the projections made by Working Party No.2 most countries' current deficits will not disappear before 1985. INTERFUTURES scenario A encounters the same difficulties if the structure of exports is not continuously moving towards capital goods, which implies a high investment rate and import propensity reduced to a minimum. Another essential component is the demand for energy, which we shall return to later.

In theory, it should not be necessary to analyse the balance of payments constraint in a world of flexible exchange rates, because the purpose of adjustments in these rates is precisely to eliminate tendencies towards chronic surpluses or deficits. However, as in many other sectors of the economy, the difficulties stem mainly from the time-lags and imperfections in the adjustment processes. They are due first of all to the magnitude of capital flows, which do not have the same dynamics as trade in goods and services, and often introduce a factor of instability.

Secondly, variations in exchange rates are very sensitive to domestic prices and costs and to their expected future levels, but the impact of these variations on real payments is both less and delayed, whereas real payments react rapidly to growth and to the composition of output.

Moreover, market pressures are not at all symmetrical; even where national counter-inflationary policies are inadequate, the need to take action to eliminate balance of payments deficits is dictated by the entire discipline of the workings of international finance, whereas pressures to reduce a surplus are less immediate and less direct. Surpluses result in exports of capital and the viability of this arrangement assumes that deficit countries will accept imports of capital and the future indebtedness which they create.

The result? A basically asymmetrical system and weak re-stabilising mechanism with a consequent strong tendency for each country to consider that its growth prospects are limited either directly by balance of payments considerations or indirectly by the possible effects of domestic inflation on the demand for monetary assets and therefore on exchange rates. Uncertainty over the rate of expansion in other countries leads each country to bring down its own growth rate and the effect of this unco-operative behaviour is to put each participant in a worse position.

With a system of flexible exchange rates, the performance differentials between OECD countries in respect of inflation rates, balance of payments equilibrium and resistance to a decline in the exchange rate are liable to widen. The countries with strong currencies and payments surpluses are the first to benefit from a general upturn in growth, whilst for the weak-currency countries the competitive advantages created by a fall in the exchange rate take longer to appear. If domestic policy considerations limit the growth of some key countries with strong payments positions, serious external imbalances become unavoidable for the other countries.

In the longer term the model for international trade developed by INTERFUTURES leads to more qualified conclusions. Japan's tendency towards a chronic surplus will weaken. Germany and France, which export to fast-growing developing countries, and to a lesser extent the United States and the United Kingdom whose imports will grow more slowly, will see their currencies appreciate in real terms. Italy, Norway, some smaller OECD countries and many developing countries will have to face substantial devaluations which will increase the internal inflationary pressures.

Underlying this macro-economic mechanism is the major theme of Part V of this report, namely the need for cooperation between States in managing world interdependence.

The inflation constraint, which is probably due to the increased sensitivity of its sustaining forces, is likely to hold back growth rates in the developed economies in a period of recovery and may not be transitory.

The constraint of inflation. This report is not the place for analysing short-term inflation. The McCracken Report summed up the present state of the discussion, especially as regards monetary, fiscal and incomes policies, and certain other OECD reports have described detailed research on the subject. In the long-term perspective, however, it is difficult to avoid asking this question: is the constraint of inflation likely to reduce growth rates in developed economies, either during recovery or permanently?

Naturally, because of the very nature of the problem under discussion, we are not dealing with the inflation that derives from full utilisation of productive capacity. It is the other forms of inflation which are at issue; however, as always in this area, it is necessary to differentiate between the primary causes and the sustaining forces.

Among the primary causes, the first long-term consideration is the price of energy and industrial raw materials. It is not enough for physical resources to be sufficient. It is also necessary for decisions to be taken in time regarding investment to conserve or replace certain forms of energy and investment to extract, process and transport all fossil resources. Nor must there be any political crisis which suddenly curtails supply. On these two points the diagnosis is much more cautious than in the case of physical availability of resources. Thus, the long-term tendency for real prices to rise may be compounded by sudden increases caused by shortages which are much more dangerous for monetary stability.

A second risk is that of depreciating nominal exchange rates. Such depreciations can easily occur in an uncertain world where short-term capital flows are a major balance of payments component. Their impact on domestic price levels is very considerable,especially because in some countries imports absorb a very high percentage of the national income.

According to some, a third risk, of more specifically monetary origin, is the way in which international liquidity is created and the way it affects domestic money supply.

The fourth risk stems from possible disturbances in investment mechanisms. These might lead to the appearance of bottlenecks before full employment is achieved.

However, the main problem is that of the forces which sustain inflation. Their sensitivity has probably increased - and in a manner not easily reversible in the developed countries. The speed with which expectations adjust to the slightest acceleration in inflation and, conversely, the slowness of their response to any slowdown reflect in many cases a heightened awareness of the central problem of the distribution of value added, that is to say sharing out the economic surplus and negotiating that share-out. This behaviour of economic transactors is doubly reinforced at the institutional level. Social oligopolisation enables the various social groups to more rapidly find ways of protecting themselves from the consequences of inflation; indexation clauses are featuring more and more in pay contracts. Hence the importance of flexibility of real wages. Recent OECD studies would suggest that after four years of unprecedented unemployment the system has begun to adapt itself, with the growth rates of nominal and real wages in many countries falling well below their average levels in the decade 1962-1972 (1).

What characterises these sustaining mechanisms is the rapidity of their inflation-accentuating effect once growth starts to accelerate, and this independently of capacity utilisation. Their impact is therefore particularly noticeable in periods of recovery. Conversely, very reduced growth intensifies the struggle over the sharing of value added and may therefore also have inflationary effects.

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(1) These highly important studies were carried out under the direction of P. Schelde-Andersen.

Although liable to change in the long-term, these new aspects of inflation are not of a cyclical nature. They will make their imprint on the advanced industrial societies for a long time to come.

The three constraints represented by investment, balance of payments and inflation are naturally not independent of one another. If anything, they are mutually reinforcing

The macro-economic analysis tells us three things. First, the high-growth scenarios seem unlikely. Second, the weight of the macro-economic constraints differs considerably from one OECD country to another. Third, it is necessary to identify the social, economic and political factors that generate these constraints.

What then does the macro-economic analysis tell us?

- First, scenarios which assume that growth will return to rates of the order of 5% per year throughout the OECD area must be viewed with great scepticism. Such an eventuality seems well-nigh impossible for the period between now and the end of the century.
- Secondly, the weight of the macro-economic constraints differs fairly considerably from one OECD country to another. For example, it is no quirk of chance that inflation-rate differentials by and large reflect the intensity of social fragmentation. Macro-economic constraints might therefore prove a stronger curb on growth in some EEC countries than in the United States and Japan.
- Finally, it is necessary to look deeper, beneath the macro-economic manifestations, for the social, economic and political factors that generate these constraints. This is a hazardous undertaking in a field where science is unsure of itself, but intellectual honesty demands that it be attempted.

(b) Social curbs on growth

Behind the macro-economic constraints there are social curbs on growth. The analysis suggests three kinds: institutional sclerosis, changing values and the decreasing ability of governments to co-ordinate their policies.

In a recent report, Olson (1) rightly insisted on the need to distinguish between the sources and causes of growth: "The sources of growth are the increases in resources and other developments that are the immediate occasion of the increase in output: the additional capital that has been accumulated, the improvement in the quality of the labour force that can result from more education and training, the new technologies which increase the amount that can be produced with given resources, and so on". On the other hand, the causes influence the decisions to save and to invest, the rates of innovation, the adoption of more or less efficient combinations of inputs, etc. They are much less well understood than the sources.

We discussed the problem of sources in a macro-economic framework because they are closely bound up with the constraints described above. But are there not deeper causes responsible for the emergence of these constraints? The analysis suggests three: institutional sclerosis, changing values and a reduced ability of governments to co-ordinate their policies.

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(1) M. Olson: The Political Economy of Comparative Growth Rates. op.cit.

(i) Institutional sclerosis. This is intimately connected with social oligopolisation. Oslon sums up what happens in a few lines. "Associations that provide public goods are for the most fundamental reasons exceedingly difficult to establish, especially for larger groups; such associations will not attract a significant percentage of large and scattered groups like consumers, tax-payers, the unemployed, or the poor; associations that can promote the common interests of some groups will be able to establish themselves, but only in very favourable circumstances and thus often only quite some time after the common interest came to exist; as associations with monopoly control or political power do emerge they tend to delay innovations and resource reallocations that engender economic growth, though this tendency may be greatly diminished if the producers' association includes a large enough proportion of those who lose from slowing the growth rate". (1).

To the extent that since the Second World War the OECD countries have not suffered any disturbance which could slow down the process of gradual institutional sclerosis, it would become increasingly difficult for them to adjust to the economic and structural changes of recent years.

Consequently, tensions are concentrated around the distribution of the economic surplus. The latter, reduced by the pressures of external competition and by resistance to the redistribution of resources, is then cut by levies exacted by the State, which has to respond to the persistent demands of certain groups. As for the workers - wage-earners or others - they are organised not only to defend their existing share, but also to try to obtain the future share which they consider to be just in the context of their expectations. They challenge the distribution of wealth and the legitimacy of profit. This clarifies some aspects of investment and inflation, whilst more generally the discussion of growth seems inseparable from an analysis of structural adaptability.

It would be interesting to attempt a diagnosis of the differences in institutional sclerosis between OECD countries in order to form an opinion regarding their future growth prospects. Japan, thanks to its community spirit and the country-wide coverage of many of its associations, would no doubt be found to be in less danger than other countries of the OECD.

(ii) Changing values. The emergence of minorities believing in different values and the uncertainty regarding the general trend of values will probably strengthen macro-economic constraints at first. Investors hesitate regarding the returns from new kinds of demand and are put off by new controls. Governments have to satisfy a wider range of demand. Enterprises find that dissatisfaction with types of organisation changes into requests for financial compensation, etc. Changes in values not only challenge the legitimacy of growth, but also increase the obstacles in the way of achieving it.

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(1) M. Olson: The Political Economy of Comparative Growth Rates, op.cit.

(iii) The reduced ability of governments to co-ordinate their policies. This factor will be central to Part V, so that it can be stated here without description and comment only that it has an influence on the nature and operation of the international system and therefore on balance of payments constraints. Incidentally it adds new uncertainties which no doubt have a negative impact on the expected returns from certain types of investment.

Thus, the scenario for rapid growth may lead to interpretations which are not contradictory, but differ in depth. They make clear that it is difficult to achieve rapid growth for reasons mainly internal to the OECD as a whole, but varying in intensity from country to country.

But is it so important that rapid growth should appear doubtful? To answer this question one must take a closer look at scenarios for moderate growth.

Prospects for moderate growth

Two types of moderate growth are conceivable: a new growth around which is built a broad social consensus, and a type of moderate growth which is the natural outcome of macro-economic constraints and an underlying lack of structural adjustment.

In some ways persistent moderate growth makes it easier to solve certain problems. The pressure on prices of raw materials including oil grows weaker, the share of investment in national income declines and government budgets are relieved of the burden of policies for stimulating the economy. These gains soon prove illusory if claims for higher wages and incomes continue, because the subsequent rise in costs will cancel out the slowdown of inflation due to the lower pressure of demand; expenditure on social security and unemployment assistance will exceed governments' slow-growing revenues; lower investment will create supply bottlenecks and local pressures on prices; and international adjustments will be opposed by protectionist tendencies due to employment problems.

For the longer term, however, this description is insufficient. There is not just one avenue for moderate growth in the future and now is the time to outline the two types of moderate growth analysed by INTERFUTURES : a new type of moderate growth around which is built a broad social consensus (scenario B1) and a type of moderate growth which is the natural outcome of macro-economic constraints and the lack of structural adjustment which underlies them (scenarios B2 and B3) (1).

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(1) See Part V for scenario B3.

(a) The new type of growth

The new type of growth presupposes not only a change in values but also an adjustment of the organisation of society so as to meet non-monetary demands better at an unchanged level of national income.

In this first case, moderate growth is accepted and is geared to rapidly changing values as to patterns of consumption and production, preference for leisure and the importance attached to material possessions. One may then envisage a reduction in labour force participation rates and a less tense attitude towards unemployment, with a weaker propensity to seek a new job or change the location or nature of an existing job. In this case it is not impossible for a shorter working week to be partly offset by an increase in labour productivity per hour.

At the same time the organisation of society is adjusted so as to satisfy demand better - including the demand for material goods which is still potentially strong - at an unchanged level of national income. Signs of this are the extension of the informal sector, the development of group activities of social significance and the emergence of new forms of participation within cities, regions and enterprises.

This is the trend illustrated in scenario B1, which involves a growth rate of 3.4% per year for the OECD as a whole from 1975 to 2000. It is analysed in Part V, but two of its implications should be poitned out now :

. The first concerns its probability. In the short- and medium-term this scenario will undoubtedly be obstructed by the slowness of the change in values and the fierce resistance of those in the developed countries who do not perceive the change as an improvement in their own situation; we shall see later that the international context may also make this scenario less plausible. The longer term calls for a more qualified judgement; subterranean changes in values and an accumulation of local social innovations may build up a picture of the developed societies which has some of the features of scenario B1.

. The second concerns its stability. If limited to a single country the new type of growth appears to be unstable, because it involves some degree of internal withdrawal, but if it were to extend to a large part of the developed world and were accompanied in the Third World by the adoption of development strategies directed more towards satisfying basic needs, it would acquire a stability at national and international level which traditional slower growth will never have.

(b) Traditional slower growth

Traditional moderate growth is the result of the combination of constraints on effective management of overall demand, causing a general slowing of productivity growth in the OECD countries.

In the second case, moderate growth is the result of the combination of constraints on effective demand management mentioned earlier (continuing low investment, foreign trade constraint, continuing inflationary trends and imbalance between energy supply and demand) with, as a back-cloth, the twofold social fragmentation suffered by developed societies and a certain institutional sclerosis. This causes a general slowdown in productivity growth in the OECD countries, which is reflected in the scenario's numerical assumptions.

Table 25 shows the growth rates in some countries according to this scenario. They can be assumed identical to the rates in scenario B1 for national income, but the latter are for quite a different economic structure (1).

Table 25

Growth rates for a sample of OECD countries
(scenario B2)

	1975/1990	1990/2000	1975/2000
Germany	3.0	2.1	2.6
Australia	3.5	3.0	3.3
Belgium	3.2	3.1	3.1
Canada	3.1	2.6	2.9
France	3.8	3.3	3.6
Italy	4.7	3.9	4.4
Japan	6.4	5.3	6.0
New Zealand	2.8	2.7	2.7
Netherlands	4.0	2.5	3.4
United Kingdom	2.8	2.6	2.7
Sweden	2.5	2.5	2.5
USA	2.6	2.2	2.4
Total	3.6	3.1	3.4

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(1) Scenario B2 is comparable with two medium-term outlines drawn up by a group of experts from OECD countries. One of them postulates growth of about 3.0% for the OECD area from 1978 to 1985 and reaches the conclusion that in those circumstances public authorities could hardly fail to transform their policies and economic transactors to modify their behaviour deeply. The other proposes an "adjusted" growth path of around 4.5% per year from 1978 to 1985.

Scenario B2 is inherently unstable, because it implies internal conflicts, dissatisfied social groups, persistent unemployment and increased government intervention. This situation may lead to renewed protectionism (scenario D), very slow growth, unacceptable rates of unemployment, loss of political and social stability in the developed countries and fragmentation of their external economic and political relations, especially since this particular scenario does not allow for differences in the short-term intensity of the macro-economic constraints which the various countries have to face.

Thus the economic prospects of advanced industrial societies depend on how they respond to their present inability to restore strong demand and reduce unemployment. The most recent figures suggest that they are responding in two ways.

- In some countries the machinery of the market, with moderate government intervention, is bringing wage claims back into line with the trend of productivity and the terms of trade. Real labour costs are flexible enough to allow factor costs to adjust to the existing capital stock after a certain time, so restoring profits and later investment.
- In other countries the pressure to maintain or even to increase real labour costs (especially real wages) is widening the gulf between the trend of these costs and that of productivity, with a consequent increase in unemployment. It is necessary to find out how to absorb this unemployment in a socially acceptable way; by shorter hours, part-time working, an earlier retirement age or voluntary withdrawal from the labour market.

This discussion makes it clear that a return to full employment will not be achieved by macro-economic policy measures alone, which brings us back once again to the problems of structural adaptability.

Economic growth, changing values and structural adaptability

Avoiding the slow-growth trend in scenario B2 will be a major concern of governments in the future, but in thinking about suitable policies it is necessary to analyse the structural adaptability of the advanced industrial societies, an adaptability which results from the interaction of pressures and rigidities.

What then are the conclusions of this analysis of the scope for macro-economic growth?

(i) In future it will be a major concern of governments to avoid the type of slow growth of scenario B2. Hence the question how to combine renewed expansion with the creation of conditions conducive to new growth. Let us state this question in other terms. When considering rapid growth it is necessary to distinguish between the recovery period, even if it extends over the entire decade 1980/1990, and the balanced growth of full employment which would follow it. The recovery period is dominated by efforts to eliminate unused capacity, while subsequent growth may take various forms, and in particular assume increasingly the aspects of new growth (scenario B1). How can the requirements for recovery be prevented from compromising future choices of types of society?

(ii) Taking a medium-term view to about 1985, it could be maintained that potential growth rates would no doubt be of the same order as in the last three decades, but the diagnosis is much more cautious as regards long-term balanced growth. Stabilisation of the size of the labour force, rising energy costs, effects of slower growth on the introduction of innovations, and changes in demand should lower the growth rate despite the positive effects which the developed societies may enjoy from their role as exporters of plant and equipment to the rest of the world.

(iii) But what does a recovery period extending over a decade signify? Does it not lose all meaning in the light of the macro-economic constraints on growth which have been analysed? Would we not be imprisoned in a B2-type scenario in which potential growth would be gradually brought down to the level of actual growth by a fall in productivity, withdrawals from the labour force and the slower adoption of innovations?

In other words, could the recovery be sufficiently rapid to prevent a lowering of the potential growth ceiling? A number of experts now doubt this very much. Hence the urgency of the question of how to reactivate private investment together with a better functioning of the labour market that will lead back to full employment.

The answers to these questions clearly presuppose an analysis of the structural adaptability of advanced industrial societies, i.e. a description of the pressures on the structures of these societies and then of the rigid elements in them which resist change.

3. PRESSURES ON STRUCTURES OF ADVANCED INDUSTRIAL SOCIETIES

There is nothing to indicate that the pressures on advanced industrial societies will be any stronger in the future than in the past, but their nature will change and, above all, they will be exerted in a context of slower growth that will make adjustment more difficult. Four sources of pressure will be considered: population, final demand, the cost of exchanges with the physical environment and changes in the competitive positions of economies.

A novelty? Clearly not. One need only recall the upheavals in the structures of these societies in the past twenty-five years; the explosive growth of large conurbations, the migration of farm workers, the recovery of the birth rate in Europe, the spectacular development of certain sectors of industry, the extension of education, etc. Nothing indicates that pressures will be stronger in the future than in the past, but their nature will change they will be exerted in a context of slower growth which will strengthen them, and they will no doubt encounter stubborn resistance.

In their different guises the origins of these pressure show up in various parts of this report: population growth marked by the ageing of the population and by changes in participation rates and the size of the labour force; changes in final demand under the combined influence of population, values, income levels, price structures and the sizes of significant social groups; an increase in the cost of exchanges with the physical environment (higher prices for energy and certain raw materials, and the influence of environmental protection policies); and changes in the competitive position of the developed countries' economies, both as between one another and vis-à-vis the Third World, and at global as well as sector level.

Let us examine these different pressures solely from the standpoint of stress on structures so as to avoid future repetition.

(a) The influence of demographic trends

The major demographic phenomena are the changing age structure of the population and the trend in the labour force.

The first point to consider is the changing age structure of the population in terms of past and future birth rates, though we need to place this phenomenon in its proper context by recalling some facts too often forgotten :

. Even if there were a consensus in the developed countries with growing populations for a stationary population and couples acted accordingly, this objective would not be achieved by the end of the century because even if the conditions for keeping the population stationary were fulfilled now, it would increase by more than 25% before becoming stationary.

. Fertility will continue to fluctuate in the future, probably averaging between 1.5 and 3 children per female in a given age group, but with the first figure the population would be halved in 70 years, whereas with the second figure it would double in 58 years. Even small differences in fertility over a long period lead to large differences in the size of the population. Fluctuations in fertility subject the demand for certain goods and services and the demand for jobs to wide variations, so that the more rigidily society is organised, the higher are its economic and social costs.

. The ageing of developed societies is a general trend. In 1950 the over-65s made up 7.6% of the population, but the proportion reached 10.5% in 1975 ; even with fairly favourable birth-rate assumptions, it would rise to 12.4% by the year 2000. Still more significant is the fact that in the same conditions the over-75s would make up 38.5% of the population aged over 65 by the end of the century as against 34.5% in 1975 (Tables 26 and 27). This has two important implications for structures :

- the need to create new economic and social roles for the growing proportion of the male and female population whose age lies between the age at which one ceases to play an active part in society and the age at death. Whereas the former age is by and large falling, the latter is rising.

- The obligation to cope with increasing consumption of medical and social services (e.g. in the United States in 1970 a person aged between 17 and 44 "consumed" 4.6 doctor's visits per year as against 6.7 for a person aged over 75).

Population changes are slow and gradual, so that there is a great risk that they will not be noticed in time and that the appropriate measures will be taken too late and involve enormous economic and social costs. It is therefore necessary to stress the need for long-term policies for simultaneously reducing fluctuations and making it easier for society to absorb them. Such policies might be built around a few central ideas :

Table 26

Age structure in developed countries (1)

Proportion	1975	1980	1985	1990	1995	2000
- of children ages 0 to 4	8.2	8.3	8.3	8.1	7.7	7.5
- of children of school age 5-14 years	16.8	15.6	15.5	15.7	15.6	15.1
- of the adult population 15 - 64 years	64.5	65.0	65.4	64.9	64.7	65.0
- of the elderly population aged over 65	10.5	11.1	10.8	11.3	12.0	12.4

(1) These projections were made several years ago. The recent decline in birth rates observed in most of the advanced industrial societies is likely to result in a bigger increase in the proportion of adult groups. But since it is extremely difficult to predict fertility, the figures in the table must be viewed with increasing caution as the time horizon recedes.

Source: United Nations, Population Division, Department of Economic and Social Affairs: "Selected World Demographic Indicators by Countries, 1950-2000", 1975.

- In democratic societies the individual's freedom to procreate must be respected.

- Procreation concerns society as a whole and its cost should not be borne by only certain categories of persons.

- The penalties from which families suffer should be reduced, i.e. penalities in terms of income, opportunities for economic and social advancement, opportunities for leisure, and housing.

- The tendency for fertility rates to fall will not be reversed without considerable financial expenditure.

- Policies must constitute a co-ordinated set of economic and social measures (family allowances, taxation, medical services, education, policy for female employment, housing etc.).

Table 27

Total population and elderly population of developed countries (1950-2000)

Year	Population (million)			Indices (1975 = 100)		
	Total	Aged over 65	Aged over 75	Total	Aged over 65	Aged over 75
1950	857	65	20	75	95	49
1975	1132	119	41	100	100	100
1980	1181	131	47	104	110	115
1985	1230	133	54	109	112	132
1990	1276	144	59	113	121	143
1995	1320	158	58	117	133	141
2000	1361	169	65	120	142	159

(1) The forecasts for the numbers of persons aged over 65 or 75 are relatively reliable since they concern generations whose present size is known.

Source: United Nations, Population by Sex and Age for Regions and Countries, 1950-2000, as assessed in 1973 Medium Variant,1976.

The second significant aspect of population growth is, of course, the labour force. Here two salient facts should be remembered :

- female participation rates will probably grow in most OECD countries at least until 1990, although the figures vary widely from country to country (Table 28), and whether or not the forecasts are borne out will naturally depend on the trend of the labour market;

- there will be a progressive slowdown in the growth of the labour force as clearly indicated in the last two columns of Table 29.

In short, from 1975 to 2000 the labour force in OECD countries as a whole might grow by 17.4% (i.e. by 49 million), whereas total population may grow by only 12% (i.e. by 80 million), but most of this growth is likely to have occurred by 1990.

As economists well know, even if the rate of unemployment is far from being linked with the size of the labour force, the relatively steep growth of the latter up to 1990 will no doubt aggravate the employment situation during the eighties, while manpower shortages may appear in the last decade of the century, at least in high-growth scenarios.

Table 28

Percentage of working women in
the female population aged 15 to 64 in some
OECD countries

Country	1950	1975	1990	Country	1950	1975	1990
Austria	51.1	48.0	49.5	Netherlands	28.5	26.9[a]	26.2[a]
Belgium	32.8	43.9	(50.4)	New Zealand	30.0	39.0	42.1
Canada	26.2	50.0	55.2	Spain	17.6	32.5	42.1
Denmark	49.6	63.5	74.9	Sweden	35.1	67.6	85.8
France	49.5	50.5	(51.6)	Switzerland ,	39.1	54.6	(64.0)
Germany	44.3	48.5	(52.0)	United Kingdom	40.7	55.3	60.2
Italy	32.0	30.7	32.7	United States	37.1	53.1	60.8

Source: OECD Observer, 1978

(a) Working population in terms of years worked

( ) Projections by the OECD Secretariat.

This confronts OECD countries with a twofold dilemma. How can the gap between the supply of and demand for jobs be reduced during the next decade :

- without restraining growth?
- without producing irreversible effects which would limit the labour force in the last ten years of the century?

The list of imaginable measures is well known: lowering the retirement age, raising the school-leaving age, drawing up government training programmes or subsidising in-firm training costs, extending part-time work, shortening the working week or year, creating jobs in the public sector, temporarily remitting a proportion of social insurance contributions or changing their basis, etc. But their effect could only be evaluated by means of country studies, first of unemployment and then of growth. Their irreversibility, however, should be easier to assess; increasing the number of civil servants, lowering the retirement age and legislating for shorter working time are no doubt much more irreversible measures than, for example, training schemes or part-time work.

The age structures and participation rates of populations are directly reflected by the ratios of unemployed to employed persons. According to different sources, a clear trend is emerging whereby these ratios in OECD countries will decrease or remain practically constant until the end of the century. This is a reassuring diagnosis since it implies an easing of pressures, but it immediately draws forth two reservations :

Table 29

Labour force trends in some OECD countries
(Scenarios A and B2) (a)

COUNTRY	Population aged between 15 & 64 (2)				Participation rate: civilian labour force as a % of total population aged 15 to 64 (3)			Structural unemployment in %	Maximum labour force (2)			Growth rate of labour force (4)	
	Source (1)	1975	1990	2000	1975	1990	2000		1975	1990	2000	1975/90	1990-2000
Belgium	NU B	6236	6669	6689	62.4	61.7	63.5	3.5	3738	3971	4099	0.40	0.32
France	N	32898	36627	36926	65.8	63.7	65.6	2.1	20931	22841	23715	0.58	0.38
Germany	N	36665	38090	35752	65.4	65.4	64.1	1.3	25343(5)	24587(5)	22619(5)	-0.20	-0.83
Italy	NU B	35338	38319	38509	53.7	53.0	53.5	2.5	18322	19801	20087	0.52	0.14
Netherlands	N	8728	9543	9541	54.3	57.1	63.0	1.3	4524	5378	5933	1.16	0.99
United Kingdom	N	35235	36770	36839	72.5	71.0	74.0	1.6	23762	25689	26461	0.52	0.36
Sweden	N	5261	5301	5322	77.6	77.6	78.9	1.0	3931	4072	4157	0.24	0.21
Australia	NU B	8725	11078	12537	69.8	67.0	66.5	2.0	5726	7274	8170	1.61	1.17
New Zealand	NU B	1842	2270	2551	63.2	61.1	60.9	2.0	1194	1359	1522	0.87	1.14
Canada	N	14854	18475	20437	66.3	65.1	65.7	5.2	9117	11402	12729	1.50	1.11
Japan	N	75434	85889	87662	70.6	69.0	70.0	0.9	52062	58730	60811	0.81	0.35
United States	N	137478	157919	167605	67.2	67.1	67.9	4.9	84838	100771	108227	1.15	0.72

(a) This table takes into account the information on fertility-rate changes available at the beginning of 1978.

(1) NU B = low variant in United Nations projections; N = figures taken from national sources

(2) In thousands. (3) Source: OECD Statistics for 1975; figures for 1990 and 2000 supplied by countries when available; estimates made from ILO forecasts, otherwise based on actual values in 1975. (4) calculated from the figures in the preceding three columns; (5) excluding immigrant workers.

. The situation will worsen rapidly at the beginning of the 21st century, especially if, as is most desirable, birth rates rise again.

. The increasing percentage of elderly persons in the unemployed population will add to the burden on the working population, a problem which we shall meet again when studying the rigidity caused by government expenditure.

What points emerge from this brief review of demographic pressures ?

- ageing of the population, particularly in Europe and Japan;
- influence of this ageing on the pattern of demand and on the burden that has to be borne by working persons;
- growth of the labour force in most European countries during the next decade, but the possibility of labour shortages in the last ten years of the century;
- the preference that must consequently be given to reversible measures to absorb underemployment in the 1980s.

One observation must be made, however. In demographic matters, the end of the century is not the right horizon. It is in the first quarter of the 21st century that the consequences of certain current trends may become dramatic, but it is in the next decade that action must be taken to modify those trends.

(b) Changes in final demand

A study of the prospects for final demand reveals a few relatively well-established trends. These concern :

- *the rise in capital/output ratios;*
- *the effects on final consumption produced by population movements, new values, growth and redistribution of incomes, and changes in relative prices;*
- *the share of private consumption represented by services to households;*
- *the apportionment of final consumption between private and*

It would have been desirable to consider the possible pattern of final demand in each of the main OECD countries according to the principal scenarios, but while the task was technically feasible, it was beyond the resources available. Consequently this section concentrates on well-established points and also on stating significant questions.

(1) First, a preliminary remark. For a given rate of growth the investment share in GDP should increase in all advanced industrial societies. This trend has been made clear by various studies, notably those of the Economic Commission for Europe.

Why? No doubt for three complementary reasons :

. In elementary production processes there should be a rise in capital/output ratios in almost all OECD countries, reflecting a fall in the productivity of capital accompanied by a relative in the productivity of labour.

. The composition of the domestic product would change to advantage of more capital-intensive activities. This argument should be treated with caution, since it is doubtful at inter-industry level.

public consumption;
- the composition of exports.

The significance of the change is more likely to lie in a redistribution within industries. An important case in point is energy, where most of the sources that will have to be developed necessitate very heavy investment.

. Rates of economic and technical obsolescence of capital would increase under the twofold pressure of international competition and the tendency for the productivity of capital to decrease.

(2) Meanwhile, what are the possible changes in final consumption? Among the underlying factors are population, values, incomes, prices and the expenditure policies of governments. A study of their effects raises two questions which cover a number of others, namely, how may private consumption be apportioned between goods and services; And how may the distribution change between private and public consumption?

Population? Its effects have already been outlined. Its ageing trend increases expenditure on health and leisure and probably speeds up the saturation in demand for household equipment, while the reduction in the under-20 age groups contributes towards bringing down the demand for housing (1).

New values? Their influence extends far beyond the pattern of consumption and concerns the content of private life, how people spend their time, the use of space, and working life. In fragmented societies the various groups may desire different trade-offs between work and leisure, between the consumption of purchased goods and services and that of non-market items, etc. Let us mention tentatively some tendencies which might result : a reduction in ostentatious consumption, publicity oriented more towards information, a longer life for durable goods, more non-traded community services to suit various communities, etc.

Of a more traditional nature are the consequences of raising and redistributing incomes or changing relative prices (without a radical change in values). For example, B. Cazes has outlined two patterns of final consumption for France, in one case using the assumptions of scenario A (household consumption increasing by 4.6% per year and by 2½ times from 1970 to 1990) and in the other case assuming very low growth (household consumption increasing by 2% per year and by 1½ times from 1970 to 1990). Table 30 summarises them eloquently. In the OECD area, as in France, one should find food and clothing budgets diminishing while health, culture and leisure budgets increase. More uncertain is the trend as regards durable goods. For some of them (motor cars and traditional electrical household appliances) the market will become progressively saturated, but eventually new generations of durable goods will probably appear in such varied fields as information, telecommunications, education, health and security. Some of them, like video equipment, are in their very first stages of development.

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(1) Housing construction is admittedly included in investment, but the factors governing it are of course very similar to those governing household demand.

Table 30

Distribution of household consumption in France (per cent)

	High Growth			Low Growth		
	1970	1990	Multiplier	1970(a)	1990	Multiplier
Hygiene and health	12.6	22.0	4.7	14.0	17.0	1.8
Transport and telecommunications	10.0	17.5	4.7	11.0	13.0	1.7
Culture and leisure	5.7	9.5	3	6.5	10.0	2.3
Housing	21.0	22.0	2.7	23.5	25.0	1.6
Hotels, cafés and restaurants	9.6	7.5	2.15			
Food	28.0	16.0	1.6	31.0	25.0	1.2
Clothing	9.8	5.5	1.5	11.0	10.0	1.3
Various unallocated	3.3	-	-	3.0	-	-
Total	100.0	100.0		100.0	100.0	

(a) The item "hotels, cafés and restaurants" was not estimated for the low-growth scenario; it was removed from the estimate for 1990 and the budget coefficients for 1970 were recalculated accordingly.

Source: B. Cazes (1977).

(3) What then will happen to the distribution of consumption between private goods and services? The problem is more complicated than is apparent from certain hasty assertions. First, as Gershuny pointed out (1977), shorter working time and rising labour costs will accelerate the tendency to replace purchases of labour-intensive services by purchases of goods to be transformed into services by the purchasers themselves. Hence the rapid expansion of an informal production sector. Scenario B1 in particular would favour the development of this sector. Secondly, however, household expenditure will be redistributed to the advantage of service-intensive sectors such as leisure or transport. Furthermore, new goods will be

developed which incorporate services, e.g. video-cassettes, or enable services to be obtained, such as computer terminals. Here explosive growth is made possible by the development of teleprocessing. Consequently, the growth in the share of services to households in private consumption should be considerably slower than is generally expected.

(4) Similar complex changes are found when one considers another important type of redistribution, namely the redistribution of final consumption between public and private consumption. One thing is sure, this redistribution will be the subject of conflicts whose nature will greatly depend on the growth scenarios. For example, in a scenario B2-type situation with a twofold fragmentation of society, the social groups who prefer private services to be more differentiated and better suited to their needs may revolt against taxation, while the demands for jobs to be created or protected will be strengthened by the economic situation, by the specific demands of various minorities advocating new values, and by the increasing consumption resulting from the ageing of the population and by changing standards of living. The chronic Social Security account deficit in some countries during recent years is already an illustration of such conflicts. What about scenario B1? It probably argues more for an increase in the share of public consumption but on the other hand for more pressure to decentralise public services at regional or local level and increase citizen participation. In the context of the informal sector or "third system" it may also result in certain services being taken over by households or communities. Finally, a scenario A situation may make it easier to settle the conflicts by providing more government funds and probably by reducing the variety of demands expressed. In short, perspective analysis indicates that the share of public consumption should grow in advanced industrial societies, but in the midst of conflicts reflecting what might be called the crisis of the Welfare State.

(5) As to the last component of final demand, exports from the advanced industrial societies will undergo a radical change of pattern. The proportion of products from certain industries, like electronics and capital goods, will increase significantly whilst exports of intermediate or semi-finished goods will probably decrease. There will also be an increase in exports of industrial services (e.g. engineering consultancy), which already feature prominently in exports to the Third World. At the same time, the geographical breakdown of developed countries' exports will change very significantly (see Part V).

There are no signs that changes in demand will exert stronger pressure in future than in the past quarter-century. But our traditional groupings into goods and services or industrial activities and service activities are very ill-suited to "post-industrial" societies.

What conclusions can be drawn from these brief remarks? First, that there is no sign that changes in final demand will exert stronger pressures in future than in the past quarter-century, but this reassuring statement should not conceal two perhaps more important but quite different facts :

- Our traditional groupings into goods and services or industrial activities and service activities are very ill-suited to "post-industrial" societies. We lack the concepts - and even more the data - required for correctly analysing changes in consumption, in the nature of jobs, etc. Consequently what is being said about the growth of services in advanced industrial societies should be interpreted with these limitations in mind.

- Changes in the pattern of final consumption foreshadow a likely crisis in the two major institutions which have served in the past quarter-century to distribute goods and services; the market and the Welfare State. We shall return to this point later.

Between the study of final demand and that of exchanges with the physical environment a separate place should be made for the human environment of economic structures.

Between the study of final demand and the study of exchanges with the physical environment a separate place should no doubt be given to the human environment of economic structures. This is a vast field in which the new values will be expressed that will exert on economic structures very similar pressures to those resulting from exchanges with the physical environment. It is even probable that these pressures will increase in the future, whereas in the developed countries those connected with the protection of the physical environment will stabilise. But what does this field cover? A whole range of relationships stemming from life in factories or towns: noise and vibration; exposure to high temperatures or bad weather; arduous work; risks of occupational diseases and industrial or traffic accidents; loss of time and fatigue due to travelling between home and work; strain caused by traffic congestion; discomfort caused by crowding; psychological constraints or anxiety caused by the ways in which community life is organised, etc. The factors involved are the use of time, the utilisation of space and the nature of psycho-social relations.

It is easy to imagine some of the pressures on the production structures of developed countries: regulation of working conditions, development of personalised timetables, limitations on the number of personnel per unit of production, changes in work organisation, slower growth and sometimes the stagnation or decline of major conurbations, a withering-away of their centres, a tendency to create vast urban areas with lower population densities, the growth of small and medium-sized towns, etc. Moreover, these pressures will clash with private economic returns and will sometimes, not surprisingly, also have the effect of curbing structural adaptability.

(c) Increasing cost of exchanges with the physical environment

For the advanced industrial societies, an increase in the cost of exchanges with the rest of the ecosphere is possible in three areas: energy, raw materials and the physical environment.

The conclusions of Part I regarding the physical limits to growth by no means exclude an increase, for advanced industrial societies, in the cost of their exchanges with the rest of the ecosphere. The resulting greater pressures on their structures could originate in three fields already identified, namely energy, raw materials and the physical environment proper. Let us try to describe them.

Production structures and energy

There is nothing in principle which would prevent the production structures of the developed economies from being able to adjust to future rises in the price of energy, but for the adjustment to be successful certain conditions must be met.

Even if there are no long-term physical limits to the availability of energy, the industrial economies - which have not yet fully absorbed the effects of the spectacular rise in the price of oil in 1973/74 - will feel the repercussions of the energy transition. They will first have to face a long-term rising trend in the price of energy. A doubling in real terms in twenty years seems within the realm of probability. This is in sharp contrast with the period 1956-70 when energy prices fell in developed countries by 10 to 20% compared with the prices of manufactures and by 50% compared with average wages.

If the increase were steady and foreseeable - of the order of from 2 to 3% per year in real terms - consumers and industrialists would adjust to it by continually revising their investment programmes and the pattern of their operational expenditure. However, the power relationship between the OPEC and consuming countries foreshadows on the contrary a series of successive price surges, the timing and extent of which are difficult to foresee. Account must also be taken of the uncertainty created by the ignorance of resources and by the lack of continuity in the policies of certain major consuming countries.

The qualitative effects of the increase are easy to see : a relative rise in the prices of products with a high energy content with a consequent curb on demand; efforts to replace energy by other inputs (including plant and equipment) at every stage in the various production processes; a search for sites where energy is cheaper when it is difficult to replace, and so on, but in practice the situation is complicated for two kinds of reason :

- the proportion of expenditure on energy and the elasticity of substitution between inputs vary widely from industry to industry or from one production stage to another within the same industry.

- The rise in the price of energy interferes with technical progress and variations in the cost of other inputs, especially labour and plant.

The industry which consumes the most energy per unit of final demand is the energy-production industry itself, after which come metal-working, chemicals, rubber, non-metallic minerals, mining and quarrying. In all of these industries the consumption of energy per unit of output is two or three times more than in the others, including the motor vehicles industry, mechanical engineering, transport and communications.

It is not sufficient, however, to reason at the inter-industry level, as is well illustrated by comparing the iron and steel industry with the aluminium industry.

- In primary aluminium production energy requirements amount to 25,000 kWh per tonne of output, which is from 20 to 30% of total costs, depending on the price of energy, as against only 8% for wages. As three-quarters of the total cost of energy is concentrated in the smelting stage, i.e. a late stage in production, slight differences in energy prices have a substantial impact on the siting of a large part of the production process. A difference of US$ 0.005 in the kWh price of electricity is enough to make aluminium production by electrolysis highly competitive at sites remote from the points of consumption.

- None of this applies to iron and steel. It is true that in the United States and Western Europe this industry accounts for about 13% of final energy consumption and about 30% of industrial energy consumption, but its energy costs average only from 10 to 15% of its total costs, i.e. from 1.3 to 4.8 million kilocalories per tonne of liquid crude steel, depending on the production techniques used. Nevertheless, allowing for important differences in other factor costs, the price of energy has a considerable influence on the choice of these techniques. In addition, and unlike in the aluminium industry, most energy is consumed in the early stages of the production processes. Consequently direct reduction plants which consume 60% of the energy required by their process should be sited near sources of cheap energy, while electric arc furnaces and rolling mills, being less sensitive to energy costs, might keep their traditional sites. However, in the coming decade the development of iron and steel production in different parts of the world will depend on a number of other factors (see Part V of this report).

On top of the structural changes induced by energy price rises there will be the changes due to differences in price or availability between the various sources; there will be increasing recourse to electricity as secondary energy, a partial return of industry to coal with modern forms of combustion, and so on. However, the shocks to the energy system at the stage of primary energy production will be cushioned by the secondary energy sector.

How can the content of these studies be summarised? In a two-point proposition :

. Nothing in principle prevents the production systems of developed economies from being able to adjust to future rises in the price of energy.

. However, if the adjustment is to be successful, the following three dimensions must be taken into account in government energy policies :

- In view of the long time it will take to adjust methods of consuming energy (by gradually eliminating energy-intensive processes or replacing some processes by others), it is necessary to give energy policies a long-term orientation and reduce present uncertainties as much as possible.

- Everything should be done to avoid sharp and irregular increases in energy prices and at the same time to increase the capacity of developed economies to absorb energy shocks. Hence the desirability of urging industrialists to acquire techniques for making their consumption of energy more flexible.

- Care must also be taken not to spread the impact of the increase in the price of energy throughout an entire sector. Government policies should therefore leave the market to act as a guide to choosing how to consume final energy, if necessary influencing it by means of suitable signals.

Production systems and raw materials

There are long-term and medium-term reasons for believing that the upward trend in real prices of industrial raw materials will continue.

It is not easy to forecast prices of raw materials with any accuracy for more than two or three years ahead. However, there are several reasons for expecting a continuation of the rising trend in the real prices of most industrial raw materials (independent from cyclical fluctuations). There are genuinely long-term reasons, and also medium-term reasons to do with the current shortage of investment and low growth.

There is also the risk of supply cut-offs due to political events. More generally, supply conditions for industrial raw materials would put the developed economies under severe pressure if protectionism were to become widespread (C and D scenarios).

The long-term reasons include :

. The rise in extraction costs as mines get deeper, the decrease in mineral content, the rising costs of protecting and restoring the environment, mounting energy prices, etc, but the impact of these factors varies very widely according to the mineral involved.

. The impact of agreements concerning raw materials, because even if the main purpose of such agreements is to stabilise prices, it may be difficult to avoid perverse effects leading to higher prices in the medium-term. For example, if prices are low at the time of an agreement, an increase in prices is liable to be built into the stabilisation targets; if prices are high, it may be decided to stabilise them at that level or only slightly below it, notably to encourage investment and avoid a steeper rise.

. The increase in political risks in recent years has led to a regional distribution of new investment which is less concerned than in the past with the economic and geological quality of deposits. In the future, and despite differing assessments as between companies, this is likely to lead to a sub-optimum utilisation of known world reserves, thereby helping to raise prices.

The more circumstantial reasons are :

. In the world as a whole, exploration for non-ferrous metals seems to be stagnating. European companies, after greatly increasing their expenditure on exploration (by about 43% per year) over a long period, have been reducing it or merely maintaining it in real terms since the present decade began. The increased efforts by United States and Canadian companies do not offset this decline, especially as exploration in South Africa and Australia has also fallen off. As regards the developing countries, they have not yet embarked on large-scale research. In view of the future rise in consumption, current exploration activity may well be insufficient.

. The same applies to investment. The fourteen main European mining companies have reduced their investment expenditure to about its 1965 level (capital expenditure at 1976 prices on mining development: $396 million in 1966 and $379 million in 1975) after its peak in 1970/71 ($615 million) due to the copper at Bougainville and iron ore at Hamersley. United States companies seem to have maintained their capital expenditure, but have partly diverted it to deposits of fossil fuels. In other industrialised countries and the Third World countries the tendency is towards a reduction. The long lead times in the mining industry between the decision to invest and the start of extraction justify the fear of price increases which will only be absorbed in the medium-term.

On the other hand, as indicated in Part I, the role played by producers' cartels should remain modest. Nor should the resiting of ore treatment plants have more than a minor impact on prices. The only real threat is an interruption of deliveries as a result of political events, such as events affecting chrome and cobalt in South Africa, Rhodesia and Zaire. Apart from localised political risks, supply conditions for industrial raw materials will lead to strong pressures on the structures of developed economies - in particular in Europe and Japan - if there is a worldwide spread of protectionism with a North-South clash as in scenario C or a splitting-up of the North into partially isolated blocs as in scenario D.

Production structures and the environment

Environment policies help, from the standpoints of efficiency and distribution, to improve the functioning of the economy, but gauging them is a delicate matter.

Without causing real upheavals, they will generate pressures on structures and notably on industry (within industries, between industries and on an international level).

Independently of the global problems discussed in Part I, the scale of the industrial countries' efforts to control the impact of human activities in general, and of industry in particular, on the physical environment is continuing to increase. Since the services rendered by the environment (e.g. assimilation of residues) are not taken into account satisfactorily by the mechanisms of the market, environment policies have to try to correct and supplement these mechanisms from the standpoint of efficiency of allocation. There are also problems of distribution, since in the absence of regulations to internalise environment costs or prevent external diseconomies, some transactors increase their incomes by inflicting damage on others. Thus, environment policies can help in two ways to improve the functioning of the economy. But gauging these policies is a delicate matter. Apart from an inadequate knowledge of the physical and chemical effects of pollutants, the difficulty of assessing the marginal social value of an improvement or a deterioration in the environment and an ignorance of the impact of anti-pollution regulations on economic goals such as growth and employment, there are the problems posed by the complexity of procedures, increasing politicization of investment decisions and the diversion of environment policies to other ends (1). So it is in no way surprising that environment policies should serve to increase pressures on the structure of developed economies while at the same time reducing their capacity to adjust. The first of these effects (and the only one that will be dealt with in this section)(2) occurs at three different levels : within industries, between industries and on an international scale.

Within each industry, environment policies have consequences of two kinds :

. They accelerate the technical and economic obsolescence of equipment, since not only is the old equipment generally more polluting, but also it necessitates heavier expenditure in order to make it conform to the new standards. Hence the risk of plant closedowns (usually plants that are labour-intensive and located in economically depressed areas) if the tightening of standards is not announced sufficiently ahead of time. But it has to be admitted that, in this case, environment policies simply accelerate inevitable trends. For instance, a US Department of Commerce survey of 1974 revealed that in 78% of cases in which anti-pollution regulations were cited as the reason for plant closedowns, other factors were simultaneously involved (declining sales, high operating costs, obsolescence, etc.).

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(1) Although the number of clearly identifiable instances is small, a case in point is their use as justification for raising trade barriers.

(2) The rigidities induced by environment policies are dealt with in the fourth section of this part, under the heading of government intervention.

. They accentuate tendencies towards a concentration of production or marketing structures. For instance, empirical studies show that, for pollution-control facilities, the investment and operation costs per production unit treated decrease with the size of the facilities. Similarly, R&D on pollution-control is subject to significant economies of scale. Consequently, small firms may have to merge with larger groups or to cooperate with firms of the same size.

Then there are the inter-industry consequences

Environment policies accelerate the decline of certain industries in the developed economies. The industrial sectors that are the most polluting - and consequently the hardest hit by environment policies - are mainly heavy industries, whereas the consumer goods industries, with the exception of pottery, plastics and food, do less damage to the environment. Thus, according to the Battelle Institute, the bulk of the investment for environmental control purposes in Germany between 1970 and 1979 was attributable to the chemical and mineral (excluding metals) industries. These sectors accounted for 65% of total investment in this category during the period 1970-74, but this share is likely to fall to 50% for the period 1975-79, since anti-pollution investment by the two sectors is expected to rise by only 18% compared with 52% for all industry. More generally, pollution abatement does not seem to run counter to the main trends in the production structures of the developed countries (1) but, quite the contrary, to reinforce them.

. Environment policies generate new demands and new industrial activities. For instance, it has been calculated that between 1979 and 1985 waste-water and water-treatment plants will account for investment of DM 50 billion in France and DM 41 billion in Germany. The emergence of these new markets may to a large degree offset the falls in activity in sectors whose costs are steeply increased by environmental regulations. Thus, it is estimated that in the United States about 1 million jobs in 1975 were directly related to pollution-abatement activities. In Germany, environment policy created about 218,000 jobs between 1970 and 1974, and probably another 366,000 between 1975 and 1979. In France, manufacture and utilisation of anti-pollution equipment provided jobs for 173,500 persons in 1975, of whom 44,500 were in waste-disposal activities. According to the OECD Environment Directorate, environment programmes result in net job-creation in the short-term, while their effect in the longer-term might be slightly positive or slightly negative.

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(1) Electronics and services, for example, are activities that cause little pollution.

Finally, on an international scale, the structural effects of environment policies derive from differences in standards. Differences which admittedly reflect the diversity of capacities for pollution assimilation by national environments or distinct policy trade-offs between social goals, but which also sometimes conceal other intentions to the point where it is difficult, with the currently available information, to distinguish genuine environment policies from those which are simply pretexts.

Cross-section analyses, however, reveal a strong correlation between the level of national income per capita and the intensity of demands for improved quality of the environment. If this situation were to continue, the policies of the developed countries would remain very similar to one another, whilst there would still be appreciable differences in standards between developed countries and most Third World countries. What would be the structural consequences of this state of affairs?

- Between developed countries, differences in product standards may distort international trade relations and the industrial structure, since it is more costly for foreign firms to meet the standards of a country in which, by and large, they do less business than domestic firms. The automotive and food industries are cases in point. Furthermore, even if product and production standards are the same, the subsidies granted for purposes of environmental protection may artificially improve the competitiveness of domestic firms.

- Between North and South, the difference between policies might produce two distinct effects :

. First, increased competitiveness of enterprises in Third World countries, although most of these enterprises export consumer goods for which production conditions are little changed by environmental regulations. Moreover, as the range of developing-country exports widens, the rise in national incomes is likely to foster stricter environment protection standards in those countries.

. Secondly, a transfer of activities, by multinational firms, from the developed countries to the developing countries. Admittedly, less stringent environmental regulations will seldom on their own warrant such transfers, but combined with financial incentives and lower wage costs, they might influence the location of pollution-creating production units, e.g. chemical and raw material processing plants.

Thus, without resulting in real upheavals, the rise in the cost of exchanges with the physical environment will continually generate numerous and varied pressures on the productive systems of the developed countries. These pressures will not be confined to industry, of course. They will also affect agriculture and services like transport and tourism, and furthermore they will make themselves felt in areas not directly related to production, such as types of urban life or use of space.

(d) Changes in the competitive positions of developed economies

In terms of technologies and factors, is the pattern of comparative advantage among the various economies, developed and developing, in the process of changing radically so as to generate considerable and differential pressures on the economic structures of the OECD countries?

Two elements need to be considered :

- *the trend in the cost of labour;*
- *changes in the relative cost of capital.*

It is some time since the theory of international trade first highlighted the role played in trade by technology and the relative prices of the various factors of production in each economy. Even elementary textbooks give an account of the concomitant determination of trade and real exchange rates and explain how a country simultaneously imports goods with a high labour input from countries where domestic labour costs are lower in relative terms, and goods with a high capital input from countries where, on the contrary, it is domestic capital costs which are lower. Granted, the two-factor models are too meagre to be able to describe fully a reality in which it is also necessary to take "human capital" and natural resources into account. Granted, they also overlook, in their simplified versions, the phenomena of learning and apprenticeship, these being of essential importance both in the accumulation of "human capital" and in the progressive mastery of techniques. Granted, they omit everything that makes up the socio-political reality of a nation. Nevertheless, the theory of international trade does raise a question fundamental to the future of the developed countries both in their relations among themselves and in their relations with Third World countries. In terms of technologies and factors, are the comparative advantages of the various economies, developed and developing, in the process of changing radically so as to generate considerable and differential pressures on the economic structures of the OECD countries? This is a difficult question which will crop up again and again in this report, both in Part IV, in the analysis of North-South relations and in Part V in the study of global interdependence. As for the answer, it will emerge only gradually, but essentially it is in the affirmative. In other words, the international context will exert, throughout the next quarter-century, constant pressures on the production structures of the advanced industrial societies, pressures which will come both from other developed economies and from certain developing countries.

Two aspects of this will be considered here. They are :

- the trend in the cost of labour in the developed countries;
- changes in the relative cost of capital in conjunction with technology transfers and the investment strategies of multinational corporations.

Changes in comparative advantage and relative labour costs

In the developed countries, the rates of increase in unit labour costs remained low until about 1968, then rose steeply between 1969 and 1975 both in real and nominal terms. Exchange rate changes have not removed the inter-country differences in these rates of increase and hence they have a direct impact on the international competitiveness of the various economies.

Two of the most significant indicators of shifts in the competitive positions of countries, or of industries in those countries, are the level and the annual rate of change in labour costs per unit of output - provided, of course, that these costs incorporate not only wages but also all social insurance and other indirect costs.

Among developed countries, it is the rates of change which are probably of more interest, whereas between developed and developing countries it is the trend in the absolute differences which is especially important.

For the developed countries, the trend over time in the rates of increase in unit labour costs is quite remarkable. In most of them, these rates remained relatively modest until about 1968, then climbed very steeply from 1969 to 1975, in both real and nominal terms and not only in manufacturing industry but throughout the economy. Furthermore, shifts in exchange rates have in no way closed the differences in these rates of increase as between countries; so the movement of unit labour costs has a direct impact on the international competitiveness of the various economies.

This phenomenon can best be analysed in stages.

(i) First of all, what do we find when we look at unit labour costs in real terms? The trend in the ratio of wage costs to gross domestic product, numerator and denominator expressed in national currency units at current prices, is indicative, even if a measure of caution is required because of changes in the composition of gross domestic product, in production and employment structures and in income distribution.

Table 31 shows that in general real labour costs rose more rapidly than productivity in the two periods 1960-68 and 1969-75. Furthermore, with the exception of the United States, the Netherlands and Sweden, the gap between the rate of increase in labour costs and in productivity was considerably greater in the second period than the first. The trends were steepest in the United Kingdom, Japan and Switzerland, but they were also very pronounced in Italy, Belgium, Denmark and Germany. In the second of the two periods, the highest rates of increase were in Japan, Italy and Belgium, three cases which have to be interpreted differently in the light of respective labour cost levels at the outset of the period.

This growth of real unit labour costs may be at once the effect and the cause of structural changes.

. The rise at the end of the 1960s can be explained in the first place by manpower shortages and changes in labour market characteristics, but it is also attributable to the expansion of employment in the service sector and to the fact that wages in that sector kept pace with those in industry even though productivity gains were generally smaller.

Table 31

Average annual increase in labour
costs per unit of gross domestic product
in 1960-68 and 1969-75 (per cent)

	In real terms		In nominal terms	
	1960-68	1969-75	1960-68	1969-75
United States	0.6	0.0	3.2	6.5
Canada	0.5	0.7	3.4	8.9
Belgium	0.8	2.6	4.1	10.7
Denmark	0.9	2.5	6.8	12.1
France	1.0	1.9	5.3	10.2
Germany	0.8	1.8	4.0	8.6
Italy	1.1	3.8	5.6	15.3
Netherlands	1.8	1.4	6.8	10.0
Sweden	1.3	1.1	5.3	9.2
Switzerland	0.5	2.0	4.8	9.8
United Kingdom	0.1	2.1	3.8	14.8
Japan	0.5	4.0	5.3	13.7
Total	0.8	2.0	4.9	10.8

Source: Calculations based on OECD statistics: National Accounts of OECD Countries, 1976.

. But when the rise in labour costs cannot be passed on in prices or offset by productivity gains, it increases the competitive pressure on labour-intensive activities.

The upward trend in unit labour costs is not confined to the service sector; it is also to be found in industry, though to a less marked degree. Industry in the developed countries has been less and less able to offset higher labour costs by higher productivity.

These findings bring one back to a question already raised in the discussion of macro-economic growth prospects. To what extent has the rise in labour costs reduced the profitability of enterprises and diminished the propensity to invest or, on the contrary, accelerated capital/labour substitution? It has probably had both effects, giving cause to fear that in the low-growth scenarios investment would be mainly of the labour-saving kind.

A first conclusion may therefore be drawn. For activities with a high labour content, the competitive position of the developed countries as a whole, and that of some of them in relation to others, has deteriorated since 1968.

(ii) Let us now introduce the effects of inflation by considering the trend in the nominal cost of labour (expressed in current units of national currency) per volume unit of gross domestic product (evaluated, of course, in constant units of national currency). The significance of this calculation is that it gives an idea of what the change in competitive conditions would be if exchange rates had remained constant

As might be expected, 1968 still constitutes a watershed. During the preceding fifteen years, growth of the nominal cost of labour per unit of output was slow but after 1968 it accelerated sharply. The average annual rates of increase for the two periods 1960-68 and 1969-75 say a great deal: 3.2 and 6.5% for the United States; 3.4 and 8.9% for Canada; 5.3 and 10.2% for France; 3.8 and 14.8% for the United Kingdom; 5.6 and 15.3% for Italy; 4.0 and 8.6% for Germany; 5.3 and 13.7% for Japan. It could be argued that these results are partly due to the growth of the services share in gross domestic product and to the effects of relative prices, but the same phenomena are to be found in the manufacturing industry alone. If the two periods 1960-68 and 1969-75 are compared, the average annual rate of increase in nominal unit labour costs is seen to have risen from 1.2 to 6.4% in the United States, from 0.7 to 7.0% in Canada, from 2.8 to 11.3% in France, from 2.5 to 8.5% in Germany, from 2.8 to 15.4% in the United Kingdom and from 3.8 to 16.2% in Italy. The trend is similar, although less pronounced, for all the other European countries. As for Japan, the rates were 3.0% for the first period and 13.4% for the second.

These figures suggest a second conclusion. If exchange rates have not offset the nominal national trends, the competitive position of certain developed countries in labour-intensive activities has on average deteriorated even more than the real trends alone would indicate.

(iii) As a third stage, therefore, exchange rate phenomena must be introduced into the analysis. The preceding ratios for manufacturing industry are multiplied by the current exchange rate for the national currency in US dollar equivalent, giving, for each country, the number of current dollars needed to cover labour costs per unit of manufacturing output (Table 32).

The results indicate that changes in exchange rates in no way reduce the spread of rates of increase in the cost of labour after 1968. There is just one difference: the positions of the weak-currency countries like Italy and Great Britain improve, whilst those of Japan, Germany and Switzerland - and even Belgium, Denmark and the Netherlands, whose currencies were linked to the deutschemark - deteriorate. The salient fact is that in the labour-intensive industries the average competitive positions of Japan and the West European countries are deteriorating even more than those of the North American countries.

Table 32

Average annual increase in labour costs per unit of manufacturing output in 1960-68 and 1969-75 (per cent)

	1960-68		1969-75	
	in national currency	in current US$	in national currency	in current US$
United States	1.2	1.2	6.4	6.4
Canada	0.7	-0.4	7.0	7.9
Belgium	3.1	3.1	7.5	13.3
Denmark	3.8	2.9	8.1	13.2
France	2.8	2.2	11.3	15.3
Germany	2.5	3.2	8.5	17.4
Italy	3.8	3.6	16.2	15.4
Netherlands	4.7	5.2	9.2	16.2
Sweden	2.6	2.6	9.0	13.1
Switzerland	3.6	3.6	7.6	17.5
United Kingdom	2.8	1.1	15.4	13.8
Japan	3.0	3.0	13.4	16.9
Total	2.9	2.6	10.0	13.9

Source: Calculations based on figures published by the US Department of Labour, Bureau of Labour Statistics, Office of Productivity and Technology, January 1977.

(iv) This trend is not reflected at all in the overall trade balances. Other elements must therefore compensate for the relative rise in labour costs in some OECD countries as compared with others. What might these be? The small growth in unit costs of other factors of production? The factor content of exports? The design of the products exported, their image, the conditions of their delivery? Differences between the industrial sector as a whole and the export sub-sector? The geographical pattern of trade?

A recent OECD study which takes account not only of labour costs but also the costs of certain raw materials and the geographical breakdown of trade, does not produce anything very different in the way of conclusions (Table 33). In particular, it confirms that the biggest increase in costs is in respect of labour and that this trend started before the oil crisis.

Table 33

Average annual increase in relative current costs
in a common currency 1964-68, 1969-75, 1976-77 (%)

	1964/68	1969/71	1976/77
United States	+ 0.3	- 3.7	- 0.8
Canada	+ 1.0	- 1.5	+ 2.1
Austria	+ 1.1	- 0.4	+ 2.3
Belgium	+ 1.3	- 0.2	+ 2.5
Denmark	+ 0.3	- 0.4	- 2.1
France	- 0.3	- 1.2	- 3.0
Germany	- 0.5	+ 3.0	+ 0.4
Italy	- 0.8	+ 0.8	- 3.2
Netherlands	+ 1.6	+ 0.8	+ 0.8
Norway	+ 1.1	+ 2.3	+ 7.2
Sweden	+ 0.3	- 0.5	+ 6.0
Switzerland	+ 0.6	+ 1.7	- 1.8
United Kingdom	- 2.3	+ 0.5	- 2.1
Japan	- 0.1	+ 4.4	+ 3.0
Total	+ 0.3	+ 0.4	+ 0.8

Source: Calculations based on "The international competitiveness of selected OECD countries", in OECD Economic Outlook, Occasional Studies, July 1978, p.46.

Within the OECD area the salient fact is still that in the period 1969-75 the United States improved its competitive position, notably at the expense of Japan and Germany. This can be explained essentially by the conjunction of four factors: (1) differences in the rates of increase in labour costs; (2) differences in capacity utilisation ratios; (3) differences in energy prices; and (4) the revaluation of the deutschemark and the yen. The most recent figures in Table 33 indicate a continuation of this trend, some countries like Norway and Sweden being even less well placed than Japan.

The growth of unit labour costs since 1969 has changed competitive positions:
- *among the most developed OECD countries;*
- *between these countries and the OECD Mediterranean countries;*

Thus, the growth of unit labour costs since 1969 has changed competitive positions on three levels :

- among the most developed OECD countries;
- between these countries and the OECD Mediterranean countries (Spain, Portugal, Greece, Turkey, Yugoslavia);
- between these countries and the industrialising developing countries (South Korea, Hong Kong, Singapore, Taiwan, Brazil, Mexico).

- between these countries and the industrialising developing countries.

Admittedly, unit labour costs in the industrialising countries (in dollar terms) will rise in the future, in fact they are already doing so (see Table 34), but the present situation is a potential generator of considerable pressures on the structures of certain developed countries. It should not be forgotten that wage rates in the United States and Germany are from 4 to 12 times higher than those in Mexico or Hong Kong for similar jobs and the differentials for social insurance costs are even wider.

Table 34

Trend of unit labour costs after allowance for changes in effective exchange rates (average annual percentage increase)

	1963/70	1970/73	1973/76
Brazil	-5.2	3.5	13.6
Mexico	6.8	-	-
Korea	0.9	-4.4	10.1
Taiwan	7.9	4.9	19.1
Hong Kong	-	-	3.4
Main OECD countries	3.3	6.2	9.8

Source: OECD: "The impact of newly industrialising countries on the pattern of world trade and production in manufactures", 1978, Table 20

In the future, the trend in labour cost differentials will be a source of considerable pressure on the production structures of the OECD countries. Hence the importance of their policies which affect them.

What lessons can be learned from this study of the past for the purposes of prospective analysis? What can be learnt from this diagnosis that will aid reflection in terms of policies?

It is out of the question to try to forecast the trend of unit labour costs in terms of a common currency. But at least it is safe to say that the monetary system compensates very imperfectly for differences in competitive positions and therefore permits the maintenance of disparities that accentuate the international division of labour and the specialisation of the various economies. The future trend in labour cost differentials will therefore probably be a source of very considerable pressure on the production structures of the OECD countries.

Hence the importance of policies in regard to labour costs. In a market economy the adjustment between supply and demand for employment is always effected through the combination of two extreme processes. In one, the social forces impose maintenance of wage differentials between branches of activity, and employment declines in the industries that are hard put to compete with imports and rises in the sectors with higher productivity. In the other, the same forces seek to maintain employment and it is wages which adjust to the differences in productivity. To try to preserve both the hierarchy of inter-industry wages and the structure of employment implies internal or external forms of protectionism - with a risk of structural unemployment for the groups whose pay exceeds marginal productivity and shortages in those categories of manpower in the opposite situation. This means that both the decline of some activities and the expansion of others are held back at one and the same time. Even though they are far from being all-powerful in this field, the governments of developed countries would have to carry a large share of the responsibility if they were to accept ossification of the labour market too readily. This is a problem which will be looked at later from its other angle, namely the rigidities in the developed economies.

Change in comparative advantage and relative capital costs

The recent period has seen a growth in technology transfers and capital flows to the East European countries and the rapidly industrialising Third World countries.

This second sub-section focusses on relations between developed countries, East European countries and rapidly industrialising Third World countries.

Because of an apparent coincidence of interests, the recent period has seen a growth of technology transfers and capital flows between these countries, but some now fear the consequences for OECD countries of setting up production capacities in these other countries at very low capital cost.

It is necessary to differentiate between the objective factors which help to induce these transfers and flows and the factors which result from distortions in relative capital costs.

Before tackling this question, it is necessary to keep in mind a basic economic postulate which is all too often forgotten. If all prices were flexible in all countries, a developed country could not fear imports from the Third World on the grounds that wages were lower there and the cost of capital not very high. Exchange rates would simply adjust to the relative prices of capital and labour. The problem, if that is what it is, therefore lies elsewhere and stems from two causes. First, many prices are rigid both in the developed countries and in the developing countries. Secondly, government policies on either side, by modifying relative prices, may create distortions which in time will impair efficient allocation of factors of production.

In analysing this acceleration of flows of productive and financial capital, it is therefore necessary to exercise caution and try to distinguish the objective factors from those which result from an artificial distortion of the pattern of relative capital costs.

It is certain that during the recession the decline in returns on capital in nearly all the developed countries resulted in a fall in investment which, coupled with the large amounts of additional international liquidity from the OPEC countries, served to encourage a growth of productive investment in fast-developing Third World countries notably via the private banks. The cumulative amount of direct investment in developing countries doubled between

1970 and 1976, from $42.3 billion to $83.5 billion. During that period, and much more significantly than in the past, this investment was concentrated on a few fast-growing countries and on manufacturing industry rather than mining and quarrying. It was essentially the multinational firms which promoted this movement. Firstly for a technico-economic reason: they are the best able, thanks to their industrial and world trade strategy, to segment their production processes and locate some parts in the developing countries which offer better returns. Secondly for a financial reason: they have privileged access to the international capital market.

Furthermore, a trend is observable in the nature of technology transfers to the developing countries. Even if creation of wholly owned subsidiaries as such is declining in relative terms, the technologies transferred nonetheless tend to be the most efficient ones and, in many cases, the most capital-intensive. This is not only because of cost distortions, a point which will be returned to later, but also because in some developing countries with very disciplined manpower the capital equipment can be operated longer per day or per year, and therefore the original investment can be recovered more rapidly.

However, apart from these objective factors which help to induce technology transfers and capital movements, there are others which take the form of a distortion in the structure of relative capital costs. Some of these distortions emanate from the developed countries themselves and are essentially the result of their policies in regard to investment guarantees and export credits. The former in effect subsidise direct investment outside the developed countries by artificially reducing the risks. The latter have the effect of subsidising exports of plant and capital goods by reducing interest charges and, in consequence, increase the pressures on the intermediate and consumer goods industries in the developed countries - competing industries inasmuch as the siting of new capacity in the developing countries (or in Eastern Europe) is not matched by a corresponding growth of those countries' domestic markets.

Let us examine a few facts, although it is difficult to gauge exactly the distortions induced by these policies.

. In the three years 1974-76 the OECD countries made available an average of $25 billion a year in long-term export credits, whereas ten years earlier the figure was $3 billion and fifteen years earlier only just over $1 billion. Even taking account of inflation in the export prices of capital goods, the increase is considerable. These credits have certainly accelerated capacity-creation in the East European countries and the developing countries.

. Industrial sector studies (cf. Part V) show that exports of complete plants, which account for 75% of transactions with East Europe and 50% of those with developing countries, and which usually are on favourable terms, are liable to lead in the medium term to re-exports in sensitive sectors of the developed economies, such as steel, shipbuilding, chemicals and motor vehicles.

. Export credits for steel plants from OECD countries increased from US$ 867.5 million in 1966-69 to $3,593.3 million in 1976-77. The main recipients in the Third World were Brazil, Mexico, South Korea, Indonesia, Taiwan and Algeria, whilst in Eastern Europe they were the USSR and Poland. But even more significant is the fact that from 1974 to 1977 steel-plant exports to the developing countries were facilitated by official aid amounting to about 15% of the export credits.

In addition to these distortions there are those which emanate from the developing countries and also have the effect of reducing the cost of capital. In this context, multinational enterprises can artificially accelerate certain changes in structure by simply exploiting the distortions in comparative advantage brought about by government policies. It will suffice to consider the following theoretical example of an industrial investment in a developing country. The developed country of origin gives its investment guarantee; the countries supplying the capital goods grant long-term credits on soft terms; the infrastructure is financed less in the developed countries than by the host government or by development assistance; the host country grants tax relief and export aids. As for labour costs, they are low anyway. One could also mention the provisions of customs codes that facilitate sub-contracting abroad.

A conclusion on two levels :

- *As a result of world interdependence, the advanced industrial societies must expect pressures to alter their production structures.*
- *Through some of their policies they are helping to increase those pressures artificially.*

But the evaluation of these pressures is meaningful only in relation to possible rigidities.

The conclusion therefore has to be on two levels :

. On the one hand, the advanced industrial societies can expect, as a result of world interdependence, continuous pressures that will tend to alter their production structures. They will have to prepare for that.

. On the other hand, what they are doing in effect, through some of their policies, is helping to increase these pressures artificially. Hence there are two problems. Should they not revise these policies while increasing their contribution to the Third World's development - a question which is central to Part IV? Do they not, in a context of low growth, run the risk of being subjected, as a result of international competition, to adjustment pressures so strong that the adjustments will become socially intolerable.

These questions are consistent with the findings made throughout this analysis of pressures since the evaluation of pressures is meaningful only in relation to the resistance they will encounter, whether the pressures derive from demographic developments, changes in demand, exchanges with the physical environment, or shifts in comparative advantage.

4. RIGIDITIES WITHIN ADVANCED INDUSTRIAL SOCIETIES

The rigidities in the advanced industrial societies have two origins. One is the achievement of legitimate social objectives, but the other is an accumulation of ineffective institutions, procedures and rules.

With wider inter-country differences, these rigidities have probably increased in the developed countries and are liable to impair their future adaptability. Among the fields in which these rigidities exist are :

- *population growth;*
- *the labour market;*
- *State intervention;*
- *foreign trade.*

Future challenges to advanced industrial societies will take the form of increased pressures to adjust their structures, but will they be capable of meeting these challenges, i.e. of displaying the adaptability required by every human community for coping with change and inventing the future? This is another way of stating the problem of the rigidities which may reduce the adaptability of advanced industrial societies.

To avoid any misunderstanding it is necessary to remove a source of ambiguity at the outset, because these rigidities have a twofold origin; they arise both from the conscious achievement of legitimate social objectives and from the involuntary accumulation of institutions, procedures and rules which are partly irreversible and are a source of ineffectiveness in pursuing community aims, largely owing to detrimental indirect effects. The changing environment shows up these two types of rigidity, but social ethics and political realism call for a distinction between them, even if their different origins are sometimes inextricably intertwined.

The analysis leads to a conclusion with considerable qualifications according to the country, namely that structural rigidities have increased in developed societies and are liable to impair their future adaptability to change.

Among the many fields in which these rigidities will be found, which are the most important? Population growth, the labour market, State intervention and foreign trade probably deserve special attention. Other aspects are less evident: for example, the inflexibility created by large-scale technologies may be offset by the flexibility provided by other technologies.

One last but important introductory remark; the discussion of rigidities should be placed in a macro-economic context, because structural changes are both the result of environmental pressures and the counterpart of growth. In this connection rigidities may be a brake on growth, but on the other hand rapid growth facilitates the structural changes induced by the environment. If the moderate growth and under-employment of recent years continue, they alone will significantly weaken the future adaptability of developed economies. There is interaction between the structural and the cyclical.

(a) Population growth

The ageing of the population in developed countries is liable to generate conservative attitudes towards the future.

As we have seen, population growth will give rise to pressures on the structures of advanced industrial societies owing to its effects on the size and structure of the labour force and on the pattern of final demand.

On the other hand some people consider that the ageing of the population, which is one of the main features of this trend, may create various rigidities such as an orientation of values towards conservatism, distrust of the young societies of the Third World, a curb on geographical and occupational mobility, lack of imagination in adopting new solutions and so on.

Consequently it is valid to pose the question: would developed societies be rendering a great service to humanity by entering an era of declining population, whilst enclosing themselves in their relative well-being? This would be a paltry contribution to slowing down the global population explosion. Should they have a slightly increasing population to prevent a rapid decline in their proportion of young persons, the creators of new responses? Is this low growth rate required to enhance the adaptability of the social structure rather than the production structure?

The importance of this subject should not be measured by the length of this paragraph, which is short simply because the facts concerning population are widely known.

(b) Labour market

The labour market will continue to present the governments of developed countries with a very real challenge.

Besides growth of the labour force, factors in the development of a non-cyclical type of unemployment might be:

- *a change in the pattern of supply;*
- *new attitudes on the part of job-seekers;*
- *the creation of rigidities by government policies.*

The increase in the rate of unemployment in recent years is not only a cyclical phenomenon due to the recession of 1973/1975 and to the slow growth which has followed it, but is also the consequence of a long-term trend. In most OECD countries during the past fifteen years unemployment rates in the biggest boom years have increased from one cycle to the next, and also between periods with the same capacity utilisation rate (1).

This situation is explained to some extent by the growth of the labour force and by its acceleration in certain countries, but the latter factor, which may aggravate employment problems for the next decade and perhaps beyond, is combined with at least three other features of the labour market in developed countries. These features will persist during the next fifteen years and are :

. a change in the pattern of supply which tends to create certain types of unemployment

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(1) See OECD, A Medium Term Strategy for Employment and Manpower Policies, Paris, January 1978.

Table 35

Boom year unemployment rates in some OECD countries

	1960/65	1966/70	1971/76
USA		(1966) 3.6	(1973) 4.7
Canada		(1966) 3.5	(1973) 5.6
France	(1964) 1.1	(1969) 1.6	(1973) 2.0
Germany	(1965) 0.5	(1970) 0.6	(1973) 1.0
Italy	(1962) 2.9	(1970) 3.1	(1973) 3.4
United Kingdom	(1964) 1.4		(1973) 2.3
Netherlands	(1965) 0.8	(1969) 1.4	(1973) 2.4
Belgium	(1965) 1.7	(1970) 1.8	(1973) 2.2
Sweden	(1964) 1.6	(1970) 1.5	(1974) 2.0

Source: OECD employment statistics

- new attitudes on the part of job-seekers
- the creation of rigidities by government policies.

As a result, under-employment will become less and less comparable with that of the early 60s, but the labour market will nevertheless continue to present the governments of developed countries with a very difficult challenge:

- The infinite variety of human abilities and aspirations, the adaptability of individuals, the flexibility of work structures and job descriptions, and the scope for substitution between labour and capital endow the labour markets in developed economies with unparallelled complexity.

- At the same time, however, the labour market plays a major role in income distribution and in satisfying essential individual demands for employment, security, etc.

- Consequently governments cannot ignore the labour market, but they must achieve their social objectives without destroying its operation. If after intervening with counter-productive results they were obliged to manage a labour market whose effectiveness had been destroyed, the dynamism of developed market economies would be seriously impaired, to say the least. Hence a major policy problem: how can forms of intervention be found which make social objectives compatible with the allocation of jobs by the market mechanism?

Two points should be made before getting down to details: (a) the numerical job-supply curve corresponding to a certain level of activity is not a valid datum because of the scope for capital/labour substitution. Nor are the numbers of persons seeking work independent of the level or pattern of job supply. These are a couple of salient facts to keep in mind. (b) In the analysis that follows, the term "structural unemployment" means all unemployment that cannot be attributed to the current state of economic activity. This unemployment of course takes a very wide variety of forms; frictional unemployment due to people changing jobs, regional unemployment due to an absence of geographical mobility, sectoral unemployment due to a decline in employment in certain trades, unemployment due to the fact that the levels of pay offered are considered inadequate, etc. In point of fact, these different aspects intermingle constantly with one another.

Changes in the pattern of job supply

The future trend in the pattern of job supply could produce, in the medium-term, an increase in structural unemployment and consequently a higher rate of total unemployment for a given level of activity.

The past growth of the developed economies has upset the pattern of jobs offered :

. First, at sector level. For example, within the OECD area the share of agriculture in total employment declined from 17.3% in 1965 to 11.8% in 1975, while the share of industry remained almost unchanged (36.5% in 1965 and 35.3% in 1975) and the share of the tertiary sector rose from 46.2% to 52.9%. During the same period total employment increased by 0.9% per year, to which agriculture contributed -0.5%, industry +0.2% and services +1.2%. (1)

A detailed analysis makes the role played by services even clearer. When boom years in the United States and Canada such as 1966 and 1977 are compared, the tertiary sector's share of total net job creation in the intervening period is found to be 92% and 86% respectively. Moreover, in several years during that period, industry's contribution to employment was practically nil or even negative in the majority of the most industrialised European countries. Although statistics are lacking, it is also probable that among the industrial jobs created the proportion of service jobs increased.

The new phenomenon of the future will be the decline in industrial employment. A simulation made for the French economy over the period 1976-1983 on assumptions close to those of scenario B2 gives a total increase in employment of 288,000, but with decreases of 520,000 in agriculture and 466,000 in industry. In addition, with the development of the electronics complex, the borderline between industry and services will lose its significance and an increasing number of so-called industrial jobs will have the features of service jobs.

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(1) OECD, A Medium Term Strategy for Employment and Manpower Policies, Paris, January 1978.

- Within sectors the demand for specialists, technicians and white-collar workers has often increased faster than for semi-skilled or unskilled workers. The worldwide redeployment of industry discussed in Part V will hasten the elimination of some low-skilled industrial jobs in the future.

These changes do not of themselves create unemployment, but they are associated with other changes which do. For instance, the transformation of the supply of jobs increases the demand for jobs. In particular, it strengthens the tendency for female participation rates to rise as a result of changing attitudes and values. It does this in three ways. First, "displaced industrial workers are usually not fitted to fill the openings provided by the tertiary sector and policies to facilitate rehiring industrial workers in the tertiary sector appear to be somewhat limited in their effectiveness". (1). Secondly, the kinds of job created in the tertiary sector seem to fit the requirements (especially part-time work (2)) of applicants outside the registered labour force, women in particualr. Thirdly, pay in the tertiary sector is often lower than in industry, which does not always make the new jobs attractive to workers coming from industry.

Furthermore, the arrival of new categories of job-seekers sometimes makes it possible- at least at macro-economic level - to replace higher paid male adults by lower paid workers, in particular women and young persons. Non-wage costs are affected likewise, since young persons and women accept fixed-term contracts more readily and often entail lower overhead or severance costs.

Lastly, turnover seems to be faster in services than in industry, so that the increasing share held by services will, other things being equal, lead to more frictional unemployment, the more so as it is easier to dismiss young persons and women than male adults.

Thus the future trend in the pattern of job supply could produce in the medium-term an increase in structural unemployment and consequently a higher rate of overall unemployment for a given level of activity.

New characteristics of job-seekers

A number of factors are changing the characteristics of job-seekers:
- the generations entering the labour

Rising standards of living, the spread of certain kinds of education and changing attitudes towards the roles of the sexes are three forces whose underlying effect is - and will continue to be - to change the factors determining the volume and characteristics of the demand for employment.

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(1) OECD, A Medium Term Strategy for Employment and Manpower Policies, Paris, January 1978, p.140.

(2) "In several countries part-time employment now comprises between 15-18% of total employment opportunities, and it has grown about 5 percentage points in the last decade. Generally about 75% of the part-time opportunities are filled by women". See OECD, A Medium Term Strategy for Employment and Manpower Policies, Paris, January 1978, p.19.

force are better educated than their predecessors;
- *changing values and rising living standards are reducing the importance of income relative to other things;*
- *geographical mobility is decreasing.*

Consequently, the rise in unemployment may result both from the maladjustment of job supply to personal aspirations and from the less pressing need for individuals to find immediate employment at any price.

Let us list these key factors.

(i) Apart from the increasing participation of women, the composition of the labour force in OECD countries - except Japan - has been strongly influenced by the arrival of large numbers of young persons and this will continue to be so in the near future, especially in Europe. Now "because of rapidly expanding educational attainments, the current generation in the labour force is considerably better educated than any preceding one, and the change has been substantial and rapid." (1). The effect of this on the kinds of jobs applied for is undeniable, but it is not certain that the jobs offered are being adapted as quickly, particularly since the training received is, in some countries, independent of the state of the market. As relative levels of pay for different job categories are often rigid for institutional reasons, some job-seekers prefer not to be employed, because their career hopes cannot be satisfied and their aspirations regarding the kind of work cannot be fulfilled.

If, however, they agree or are obliged to work, their occupational disappointment may lead to lower productivity, more absenteeism, more frequent work stoppages or strikes, or constant pressure for shorter working hours with no reduction in earnings. By increasing labour costs this behaviour is indirectly capable of even reducing the supply of jobs.

In policy terms the implications of this situation are vital from three points of view :

. Enterprises in developed countries must devise types of organisation better suited to the abilities and motivations of the changing labour force. Improved working conditions should be regarded, not merely as a cost, but also as a means of raising productivity.

. Flexibility in relative wage levels should facilitate the adjustment of supply to demand in countries where institutional rules introduce rigidities into pay scales.

. The spread of education will lead the developed countries to distinguish in future between education for cultural purposes (education whose monetary returns to those who receive it will decrease) and specialised training much more closely connected with the labour market.

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(1) OECD, A Medium Term Strategy for Employment and Manpower Policies, op.cit.

(ii) Changing values and rising standards of living reduce the importance of incomes compared with other factors such as maintaining the social environment or preserving the quality of private life. Hence a decline in mobility and, in the case of unemployment, acceptance of longer periods of job-seeking in order to fulfill varied aspirations more satisfactorily. However, the strength of this trend varies between North America, Europe and Japan and also between the East and West of the United States, Northern and Southern Europe, etc.

(iii) The decrease in geographical mobility should be emphasised. There are several reasons for it :

- The increasing proportion of households with more than one member at work (1), because the immobility of one member of a couple affects the mobility of the other member and because career opportunities or differences in earnings have to be greater in relative terms to act as a sufficient incentive.
- The increase in one-parent families (at least as long as special support mechanisms are not widespread).
- Possession of flats or houses, especially in Europe where tax systems and the operation of the real estate market make buying and selling expensive operations.
- Features of the school system, especially in countries where decentralisation makes the syllabi so heterogeneous that moving from one area (or school) to another makes it difficult to continue children's education.
- Greater importance attached to the point of view of children who wish to stay in the same school environment, etc.

On the other hand some factors do not have only negative effects on labour mobility. Although severance pay delays voluntary labour movements, it facilitates retraining, as do training allowances. Unemployment allowances enable their recipients to consider a wider range of possibilities. Wage controls make job changes one of the means of obtaining increases higher than the ceiling.

In short, seen from the angle of demand, the increase in unemployment stems both from the maladjustment of supply to individual aspirations and from the less pressing need for individuals to find a job at once at any price.

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(1) In the United States the proportion of couples in which both members are employed increased from 42% in 1958 to 59% in 1975. See David M. Freedman: Employment Perspectives in Industrialised Market Economy Countries. International Labour Review No. 1 (1978).

Rigidities induced by government policies

Although they differ widely from country to country, the policies of governments of OECD countries may have indirect negative effects on the labour market....

Although they vary widely from country to country, many OECD government policies in such fields as labour costs, social protection and taxation probably have the effect of decreasing the supply of jobs and saddling certain categories of persons with the burden of unemployment.

These policies, which are gradually moulding the behaviour of the labour force, heads of firms and trade unions, are having deep-reaching effects on the structure of the labour market in developed countries and therefore need to be discussed in a long-term context.

.... labour costs have become increasingly rigid...

(i) Irrespective of their levels, labour costs in developed countries have tended to become increasingly rigid, although in a few instances some flexibility seems to be re-emerging. Their relative levels remain comparatively steady as between one industry and another or one socio-occupational category and another (see above) and they become fixed or quasi-fixed costs because of such well-known factors as increasing recruitment costs due to the need for special training, increasing severance pay, sickness benefits, rising associated expenditure on safety, etc.

A recent OECD study shows clearly that the proportion of non-wage costs in labour costs has increased in most industrialised countries during the last decade. Thus in 1975/76 non-wage costs (including payment for hours not worked) amounted to over 40% of total labour costs in Italy, Belgium and the Netherlands, while they ranged from 20 to 40% in most other OECD countries. "There was also a tendency for the share of time worked to decline even faster after 1970 than before which suggests that fixed labour costs have become more burdensome in recent years". (1).

Consequently :

. In the prevailing uncertainty enterprises reduce their supply of jobs even at the expense of temporary losses of output.

. Persons employed are better protected, but to some extent at the expense of the unemployed. Among the latter are young persons handicapped by difficulties in making the transition from school to workplace, by inadequate training, lack of working experience and undifferentiated guaranteed minimum wages.

In terms of employment and manpower policies these long-term features of the labour market raise two questions :

- How can the negative effects of the increasing fixed labour costs be reduced? This question raises the problem of separating variable costs depending on work done in an enterprise from costs fixed at national level. It illustrates the importance of eliminating those ways of levying charges or taxes which distort the respective marginal costs of labour and capital to the detriment of employment. It points out the value of methods of remuneration which include profit-sharing.

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(1) OECD, Employment and Manpower Policies as Part of the Adjustment Process, Paris, May 1978.

- How can discrimination against the most vulnerable groups be avoided, i.e. against young persons, adults aged over 50, handicapped persons, women (to some extent) and those who are ill-equipped to find jobs at guaranteed minimum wage levels? No doubt by strengthening the action already taken by governments, such as selective but economically justified measures in favour of certain categories; schemes for training adults over 50, women, and so on (1); more attention by the educational system to vocational requirements, whether training for young persons or continuous training for adults; substitution of a negative tax for an increase in guaranteed minimum wages, etc.

... certain forms of social protection are probably helping to increase structural unemployment .....

(ii) Certain forms of social protection in developed countries are no doubt helping to increase structural unemployment, although their justification is not in question. Without reverting here to their contribution to fixed labour costs, mention should be made of two other impacts :

- the marginal cost of labour is artificially increased in certain countries by national expenditure on social insurance financed from contributions calculated as a percentage of wages;

- the actual types of unemployment allowances and measures for safeguarding income sometimes reduce mobility and the incentive to work.

However, the costs of social protection undoubtedly have an influence on unemployment levels beyond the perverse effects associated with the specific procedures adopted. The issue here is not the modification of these procedures but the nature of societies legitimate choices. We shall therefore do no more than mention some facts which illustrate the connection between the two fields.

. Although it is not a general trend in OECD countries, the ratio of the unemployment benefit to the wage earred in the last job has risen in the past decade in such countries as the United States, Canada, Belgium, France, Germany and the United Kingdom.

. A recent study of ten OECD countries concludes that unemployment benefits have raised the level of voluntary unemployment in seven of them: "The United States study suggested that the presence of unemployment compensation raises the United States unemployment rate by 0.7% (mainly by increasing the duration of unemployment). Other countries in which a significant effect has been noted are Canada, Ireland and the United Kingdom. There is limited evidence of induced unemployment in France, New Zealand, and Belgium and no evidence in Germany or Italy." (In Italy, however, unemployment benefits are small, because the main method of combating unemployment is to grant subsidies for short-term jobs).

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(1) A study of several OECD countries suggests that until recently priority was given to programmes for creating permanent or temporary jobs rather than for promoting training mobility. In 1969/70 only the United States, Canada and Sweden allocated over 15% of their budgets under this head to training programmes.

Consequently some countries are afraid that induced unemployment may become more significant in the future. As unemployment benefits are usually not taxed, the combined effects of progressive taxation and inflation can lead to a paradoxical situtìon in which some persons have a higher net income when unemployed than when working. Moreover, as the regulations governing unemployment benefits do not usually take account of the situation of families with more than one income, an increase in the number of such families would clearly have an impact.

... taxation introduces rigidities into the labour market.

(iii) In addition, taxation is a source of rigidity in the operation of the labour market. In some countries the high level of taxation may tend to reduce mobility and weaken the spirit of enterprise. As regards progressive taxation which hits the middle-income bracket as real earnings increase, it evens out the net effects of differences in gross incomes and reduces any incentives to change, the more so as there is little flexibility in relative rates of pay between sectors or employment categories.

However, other tax regulations may also cause rigidity, e.g. fiscal or quasi-fiscal provisions concerning housing (transaction taxes, capital gains taxes, benefits lost when letting, once-in-a-lifetime benefits not transferable from one property to another, etc.).

The analysis of labour-market rigidities leads to the heart of the developed countries' long-term problems.

This analysis of rigidities in the labour market leads to the heart of developed countries' long-term problems :

. First, it highlights the two issues which the dual origin of these rigidities would immediately suggest :

- Considering the increased pressures for structural adjustments, governments of developed countries will henceforth have to make strenuous efforts to eliminate all artificial and involuntary rigidities, which are due to drawing up legislation without properly studying its various consequences.

- However, other rigidities are closely connected with concerns for social justice and here a choice must be made between the immediate benefits of redistribution and the indirect consequences, even in terms of social justice, of economic inefficiency. One thing is certain; the choice cannot ignore the fact that today's industrialised societies are becoming minority societies in a changing world.

. Second, it suggests a new formulation of social justice, because today's concepts to which developed societies implicitly refer might well lead them to either of two extreme situations :

- to a highly flexible, very competitive and consequently very intimidating labour market for job-seekers, combined with extensive protection for the under-privileged economic and social categories, the result being to relegate these categories to a ghetto of unemployed persons excluded from the economic system, or

- to progressive sclerosis of the labour market with a narrowing range of net remuneration, considerable protection and measures ensuring an artificially high level of employment, leading to seriously reduced adaptability.

The risks of these two extreme situations would perhaps be more easily avoided if social justice were conceived mainly as the fulfillment of every individual through active participation in the life of his society, and if developed countries progressively reassessed their long-term employment poliices from this wider viewpoint which is more in keeping with the combination of increasing external pressures and the diversification of individual aspirations that are likely to arise in the future.

These thoughts on the labour market thus lead to a broader study of types of government intervention.

(c) State invervention

Without discussing the question of balance between the public and private sectors, it is interesting to examine the rigidities that may be caused by certain forms of State intervention, notably regulatory policies, increased public expenditure and government participation in industrial activities.

Balance between the public and private sectors is first and foremost a political choice. It is also a multi-dimensional choice, since the pure market economy with private enterprises and the centrally planned economy with State enterprises are textbook archetypes among many other possible archetypes. Reality is infinitely more complex, and if one thing is certain it is that the various OECD countries will in the future, as in the past, give different and probably qualified answers to this question.

The purpose of this section, therefore, is not to go into this issue but simply to examine the rigidities that may be introduced into advanced industrial societies by certain forms of State intervention and the adjustments that may prove necessary in order to accommodate the change. Three aspects of State intervention deserve to be considered : regulatory policies, increased public expenditure and government participation in industrial activities;

Regulatory policies

With the changing pattern of values and the emergence of new demands, the industrial societies are increasingly seeking

Whether measured by the number of government agencies, by the number of persons employed or by the amount of legislation enacted, the regulatory activities of governments have increased during the last decade and their nature has changed. New ones have been superimposed onto the traditional regulations concerning certain industries, the maintenance of competition or the normal functioning *objectives that are not expressed in terms of national income growth or distribution of money incomes. What trade-offs must be made between these objectives? How are they to be pursued effectively and with what regulatory policies?*

of certain markets. The changing trend of values and that of demands ill-satisfied by the markets in affluent societies have given rise to new regulations with broader objectives: consumer protection, higher standards of safety, quality of the environment, maintenance of biological equilibria.

To a generation accustomed to steady growth of income, it may have seemed axiomatic that because these new objectives were just, it was possible to achieve them without a sacrifice. But after a few years of slow growth and unemployment, some people in the developed societies are beginning to wonder. Such people stress the negative influence which these new objectives may have on productivity, investment, structural adaptability and growth in terms of national income. They cite the uncertainty caused by the absence of established rules and by frequent changes in standards; the additional expenditure and risks occasioned by administrative, legislative and judicial delays; the costs entailed by compliance with stricter rules and standards; the psychological consequences of the deterioration of the business world's image, and so on.

But this present debate foreshadows future ones: as values continue to change and new demands emerge, industrial societies will see more and more objectives that are not expressed in terms of national income growth or distribution of money incomes. But it hardly needs saying that in the future, as in the past, the amount of resources available will still be limited and, in a context enriched by new objectives, the advanced industrial society will still be confronted with the two fundamental questions of the economist :

- What trade-offs must be made between objectives, once the complementarities and contradictions have been eliminated?
- How are these objectives to be pursued effectively?

The first question brings one back to the need for a continuing political debate so that the citizens of democratic societies may be made aware of the full range of possibilities. The second raises the problem of the institutions and methods that will make it possible to pursue the new objectives effectively without needlessly compromising the functioning of the institutions through which the traditional objectives are achieved.

This leads on to the question of the regulatory policies of governments.

The host of different issues likely to give rise to government action in the future should serve to establish the inadequacy of attitudes that simply postulate outright rejection of new forms of intervention. On the other hand, the unguarded extension of government regulation of economic and social activities might not only encounter stiffening resistance from citizen groups but also increase the rigidities within advanced industrial societies (1).

What principles might be applied by governments in their regulatory policies?

So it needs to be seen whether there are a few principles that might inspire governments in their regulatory policies.

(i) Governments often have the choice between taking regulatory action (with outright control, authorisation or prohibition) and sending out suitable signals to markets so that individual behaviour is modified to conform to the collective interest (e.g. subsidies or taxes). But in the long term there are a great many areas - pollution control, control of health-care expenditure, energy conservation - where the regulatory approach is seen to be too narrow, too static, relatively inefficient and ineffective. Policies which modify individual behaviour while maintaining decentralisation of the decision-making process, would permit more continuous and more flexible adjustments.

(ii) Governments can organise their services with a greater or lesser degree of decentralisation. But if ill-conceived, centralisation and decentralisation are a source of inefficiencies and inequities.

. Central agencies seldom possess the information processing and decision-making capacities needed to master a broad range of individual decisions. Collection of adequate information, judgement adapted to the facts of the situation and rapid adjustment to the requirements of a changing economic reality are hardly possible when too great a distance separates policy-makers and administrators from the general public.

. Conversely, decentralisation that results in a great number of different rules and which obliges each transactor to apply to many different administrative departments is a source of inconsistencies and slows down development considerably (2).

Hence the importance for most advanced industrial societies of questioning both excessive centralisation and decentralisation of which the sole effect is to make relations with the administration even more complex. A minimum number of rules by central authorities and as wide as possible a decentralisation of their enforcement among multi-functional bodies are probably two guiding principles to be considered (1).

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(1) Cf. Charles L. Schultze, The public use of private interest. The Brookings Institute, Washington, 1977.

(2) According to some sources, legal and administrative formalities in the United States have lengthened from 5 to 10 years the time needed to open a coal mine, since a hundred or so different permits are required before construction operations can begin.

(iii) Governments are duty-bound to facilitate the participation of citizens in the formulation and implementation of regulatory policies. But it is a very delicate matter to organise this participation. For while the establishment of participation admittedly brings both the support of the groups concerned and the information that enables the regulations to be adjusted to realities, it is also liable to increase the number of pressure groups, encourage the substitution of local interests for the interests of society as a whole and give rise to new forms of social sclerosis. So, parallel with participation, it seems essential to develop institutions capable of informing individuals about the economic and social realities and about the overall constraints that limit the range of possible choices.

(iv) Regulatory policies have to be conceived in a long-term perspective. In reality they are too often a response to an immediate problem, with the result that direct intervention is often unavoidable. However, it would be preferable to substitute as soon as possible forms of action that carry a greater degree of incentive and give the system back its dynamism, innovative capacity and the ability to correct its mistakes. Especially since, if government intervention continues to grow in the advanced industrial societies, the capacity to implement appropriate social interventions will increasingly become one of those scarce resources beloved by economists.

As for the scale of governments' regulatory policies, this is obviously related to the volume of public expenditure.

Increased public expenditure

Growth of public expenditure represents one of the most delicate conflicts of the future in the advanced industrial societies.

This is a subject which has to be approached with a proper appreciation of the credits and debits. Who would deny that if public expenditure is rising, it is partly in response to demands from politically significant social groups? But who, on the other hand, would not admit that the increase is also attributable to the internal dynamics of government and to the lack of demand management caused by the absence of direct links between the volume of free services provided by the State and the volume of taxes paid? Finally, who does not wonder to a greater or lesser extent about the risks inherent in a continuing growth of public spending: difficulty of organising non-market activities efficiently, possible dwindling of incentives to work and to invest, reduction of the private sector's capacity for structural adjustment. The recent revolt of the Californian taxpayers shows only too well that we are approaching one of the most delicate conflicts of the future in the advanced industrial societies.

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(1) For a more detailed discussion of this point, see W. Michalski: Leistungsfähigkeit und Wirtschaftlichkeit in der öffentlichen Verwaltung, Hamburg 1970, pp.116-118.

A brief review of past trends will now introduce the discussion of future prospects and a few major political themes.

As a proportion of GDP public expenditure in the OECD countries rose from an average of 28% in the mid-fifties to 41% in the mid-seventies.

Over the last twenty years, public expenditure as a whole, including various transfer programmes, has grown more rapidly than national income in the OECD countries. As a proportion of GDP, this expenditure rose from an average of 28% in the mid-50s to 34% in the mid-60s and 41% in the mid-70s. And what is the reason for this increase? It is probably a natural response to the rise in living standards. Growth of per capita incomes generates a more than proportional increase in services in such areas as education, health, transport, communications and so on. Furthermore,as pointed out in a recent OECD study "greater absolute wealth may also make relative inequalities less tolerable and lead to strong pressure to redistribute incomes and to improve the equality of access to essential services such as health care, education and housing". (1).

In recent years, however, the economic crisis has contributed to the increase in the proportion of public expenditure. The slowdown in economic growth has led to increases in unemployment benefits, regional development subsidies, incentives for new industrial activities and aids to ailing industries. For the United Kingdom alone, and not counting unemployment benefits, such expenditure amounts to approximately US$ 6 billion.

Nevertheless, the past rate of growth of public expenditure has differed widely from country to country and the differences between the relative sizes of public sectors have widened. If OECD countries are ranked according to the growth in their public expenditure over the last twenty years, four groups can be identified (2) :

- Six medium-sized countries (Belgium, Denmark, Ireland, the Netherlands, Norway and Sweden) where the share of public expenditure in national income has risen by two-thirds, mainly on account of an above-average growth in welfare outlays.
- Canada, with an increase of 50% largely due to a rapid growth of educational expenditures.
- Seven countries (Austria, Germany, Greece, Japan, Spain, the United Kingdom and the United States) with an increase of one-third or more.
- A few countries (Finland, France and New Zealand) where the increase was smaller. Even so, it should be pointed out that the share of public expenditure in France and New Zealand in the 1950s was already relatively large. (Figure 1)

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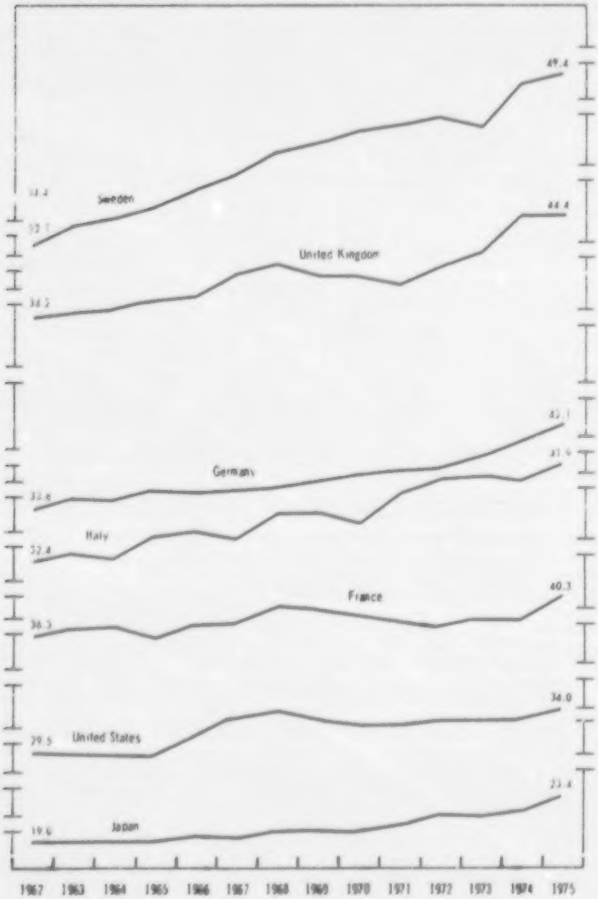
(1) See "The rise in public expenditure. How much further can it go?" in OECD Observer No. 92, May 1978, p.9

(2) Cf. OECD: Public Expenditure Trends, Paris 1978, pp.12-13.

Figure 1

Growth of general government expenditure
1962-1975

(in per cent of trend GDP, at current prices)



Source: OECD: Public expenditure trends, op.cit.

What will the future bring?

In the future the proportion of certain public expenditure items will grow, while at the same time there will probably be mounting resistance to any increases in the burden of taxation and quasi-taxation.

First of all, there is nothing to indicate that the public spending percentages of the various OECD countries will gradually converge. The differences in the way value patterns change and in the depth of the dual fragmentation, plus the differences in the intensity of structural pressures should preserve or even widen the range of situations. But this in no way prevents certain broad tendencies from being common to the different OECD countries.

Let us try to identify them.

(1) Welfare expenditure (education, health, income maintenance) constitutes the biggest share of public expenditure in the OECD countries: 46% of total expenditure around 1975 compared with 37% around 1950. There are a number of reasons for this increase :

- progressive enlargement of the segments of the population concerned, whether in the case of higher education, health, pensions or unemployment benefits;
- relative increase in the cost of public services as compared with other goods and services;
- influence of demographic trends, especially on income maintenance (changes in age structure account for 40% of the increase in the pensions share).

In the future, the first of these factors will occasion hardly any growth of expenditure, but this will not be true of the third, as we have already seen. Moreover, certain demands with regard to health or income distribution will continue to grow, along with the progressive emergence of new demands and the rise in incomes.

Conversely, and particularly in North America, the combined pressure of the taxpayers' revolt and the ideological currents denouncing the harmful effects of government "activism" and the public services' depletion of the resources necessary for private enterprise has already led to some strict curbs on government spending. It may be conjectured that, all other things being equal, resistance to growth of welfare expenditure will become stronger in the advanced industrial societies.

What conclusions should be drawn from these opposing trends? The OECD has recently constructed two scenarios for 1985. The first gives an increase of 2% in the share of public welfare expenditure by comparison with 1975. It assumes no policy change but takes account of demographic factors, the rise in the relative cost of public services and a growth of benefits in line with the trend of per capita income. The second scenario, on the other hand, gives an increase of 6.5%. It assumes alignment on "best practice" levels achieved by OECD countries, the introduction of new programmes and a major increase in benefits. In the long-term the share of national income allocated to public welfare expenditure should therefore increase (1), but probably more slowly than in the past.

So for the share of aggregate expenditure to remain constant, the non-welfare items would have to be scaled down.

(2) Public expenditure on assistance to agriculture and industry has averaged about 2.5% of national income during the last few years. The recent recession and the slow growth that followed have brought about a steep rise in direct subsidies to industry, especially in Australia, Canada, Ireland, Italy, Norway and the United Kingdom. But there has also been a rapid increase in indirect subsidies by way of fiscal measures such as provision for accelerated depreciation, investment incentives and so on (2).

The key factors in the future trend of government assistance to industry will of course be the growth rate and the magnitude of structural adjustment problems. In the high-growth scenario A this type of expenditure might be expected to decrease, whilst with scenario B2 there would be increased pressure for new anti-unemployment programmes and schemes for direct or indirect assistance to industry.

(3) This leaves expenditure on defence, infrastructure, general public services and debt servicing. Over the last twenty years the defence budget's share in national product has generally declined, but in the medium-term this share seems much more likely to stabilise or even increase slightly in most OECD countries. The present trend in regulatory policies is not conducive to any appreciable reduction in the cost of general public services. As to debt servicing, its increase over the medium-term is written into the budget deficits of recent years. Only on one item does there seem to be any possibility of a decrease and that is expenditure on infrastructure (housing and urban facilities), given the present demographic and urbanisation trends.

All in all, major conflicts are brewing in the advanced industrial societies, concerning the stake that the share of public expenditure in national income constitutes for the different social and economic groups.

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(1) Cf. OECD Observer: The rise in public expenditure. How much further can it go? op.cit. p.11

(2) Cf. OECD Observer: Public expenditure trends,op.cit. p.22

A recent OECD study concludes that unless there is a change in people's collective preferences, taxation may rise in line with incomes, thereby fixing the share of public expenditure in national income. (1)

One important political issue is the establishment of close links between users, with the possibility of expressing choices, and providers of services.

Among the political issues posed by potential conflicts about the volume of public expenditure, there is one that should be emphasised. Apart from the authentic demands that account for the rise in this expenditure, one of the causes of the increase is the absence of any direct relationship between the burden of taxation and the services received. Yet budget restraints, however severe, do not have the force that impersonal market constraints have (2). In systems terms, outlays on certain public services are insufficiently regulated. To control them better, it would probably be necessary to establish closer links between the users, aware of the possible trade-offs and able to express their choices, and the providers of services. Various schemes with a relation to market mechanisms have been proposed in recent years. They are worth considering, since they might simultaneously limit the growth of public expenditure and improve the quality of the services provided.

Government participation in industrial activities

New forms of government participation in industrial activities have emerged in recent years.

The OECD countries already have a very long history of government participation in industrial activities; for example in network distribution monopolies (electricity, railways, telephone), public industrial groupings to counterbalance the power of private groups or to make them more dynamic, and activities nationalised for social or military reasons.

But two new tendencies have emerged in recent years and are of significance for the future.

- The first tendency is that to avoid depending entirely on other more advanced economies or to take up private initiatives discouraged by low investment and uncertain profitability, OECD governments have, in various ways, assumed a growing involvement in advanced-technology activities: electronic components, computers, aviation, nuclear energy, space, etc. They reserve a large proportion of public orders for their national industries. In these sectors, there are already many OECD governments which, in the context of international trade, are behaving like a sort of super-enterprise. The evident justifications for these policies carry two risks. There is a risk of internal inefficiency if the intervention procedures, being bureaucratic and carrying little incentive, do not stimulate the initiative of economic transactors. And there is a risk of international inefficiency if dissemination of the best technologies is hampered.

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(1) Cf. OECD: Public expenditure trends,op.cit. p.68

(2) Cf. J. Lesourne: Les systèmes du destin, 1976.

. The second tendency is that to prevent certain traditional industries from declining too rapidly and to be in a position to control structural adjustments, some governments of OECD countries have intervened directly in those industries. This type of bailing-out is justified in the short-term by social needs and perhaps even economic efficiency, but it is fraught with consequences for the long-term. One of the advantages of the market is its power to break unprofitable economic units with all the ruthlessness that anonymity allows, but once the State intervenes, social attitudes change (1). Trading losses are no longer considered a sufficient reason for the destruction of a firm and the resulting loss of jobs. The inescapable consequence of a market mechanism has to be replaced by a political decision taken by identifiable decision-makers (2). Hence a considerable increase in the rigidity of the structures of advanced industrial societies.

It is the type of government participation in industrial activities, and the accompanying effects, rather than participation per se, which in the future might be one of the elements of the institutional sclerosis that is perhaps the basic reason for the slowdown in economic growth. One country seems to be an important exception. Community sense, awareness of external dependence, the restructuring role played by the major groups and the acceptance of adjustments by medium-sized firms seem to enable Japan to have an industrial policy that facilitates adjustments without ossifying structures.

The close link between the industrial policies of the governments of developed countries, particularly those of the above types, and their foreign trade policies, is the last example that will be considered here.

(d) Foreign trade

Already the dilemma between adapting and preserving structures is very much to the fore in matters of foreign trade.

The governments of OECD countries are making real efforts to resist protectionist pressures. They have repeatedly affirmed their adherence to an open multilateral trading system (renewal of the Trade Pledge in June 1978 and efforts to bring the multilateral trade negotiations to a successful conclusion). Yet in recent years a number of them have taken protectionist measures.

It is difficult to establish the extent to which new trade flows have been subjected to restrictions in recent years. A recent UNCTAD study indicates that the import barriers set up since 1974 in developed market-economy countries seem to be affecting between

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(1) Cf. Charles L. Schultze: The public use of private interest. op.cit. p.70.

(2) This is how the Hungarian economist Kornai explains the state of over-employment (with, in his opinion, harmful consequences) that prevails in the socialist economies of Eastern Europe.

3 and 5% of international trade; the percentage is certainly much higher for certain developing countries (1).

What might be the long-term consequences, particularly on the structural adaptability of the developed countries? In order to identify these consequences more precisely, trends in international trade and the chief aspects of the new protectionism are examined and a few illustrative examples given.

Trends in international trade

Trends in international trade have changed in recent years and even bigger changes can be expected.

These are analysed at length in Part V of this report in the context of the scenarios. The essential features are a reduction in the ratio of volume growth of world trade to output growth; changes in the pattern of products traded; marked shifts in the relative shares of the different countries; and great sensitivity to national trade policies.

So the accent here will be on the recent trends which help to explain the emergence of new forms of protectionism, i.e. neo-protectionism. One of the essential facts is the growth of exports from industrialising countries and developing countries. Between 1963 and 1976 the share of those countries in world exports of manufactured goods rose from 5.2% to 8.8%. Over the same period, eleven of them (Greece, Portugal, Spain, Turkey, Yugoslavia, Hong Kong, Singapore, Taiwan, Brazil, Korea and Mexico) increased their share from 2.6 to 7.2%, which represents 8.0% of the OECD area's imports of manufactures. In non-deflated value terms the increase was enormous: from $1.2 billion to $28.4 billion. In terms of market penetration, however, it brought those imports to only a little over 1% of OECD apparent consumption of manufactures, compared with about 0.25% in the early 1960s (2).

The effect on growth and employment in the advanced industrial societies is not easy to gauge. Even in the period from 1973 to 1976 the developing countries contributed more to exports of manufactured goods by the industrial countries than to the latter's imports of the same goods and, other than in the case of clothing and a small number of consumer goods like footwear, the industrialised countries have been recording increasing surpluses on their trade in manufactures with the Third World (3). Furthermore, the impact has to be gauged at the level of each country and for specific product groups, even if too fine a breakdown exaggerates the acuteness of adjustment problems.

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(1) UNCTAD: Growing protectionism and the standstill on trade barriers against imports from developing countries. March 1978, p.16.

(2) OECD: The impact of newly industrialising countries on the pattern of world trade and production in manufactures. pp. 11-16.

(3) Cf. Richard Blackhurst, Nicolas Marian, Jan Tumlir: Adjustment, trade and growth in developed and developing countries, GATT studies on international trade, No. 6 September, 1978. p.39.

Nevertheless, there can be no doubt that these trends are a consequence of shifts in comparative advantage, and have contributed to the emergence of neo-protectionism.

Major aspects of neo-protectionism

Neo-protectionism is both an expression of existing rigidities and a starting point for new rigidities.

Three characteristics must be emphasised :

. The erection of trade barriers is less and less an attempt to correct an overall imbalance in current trade, and more and more a response to long-term structural difficulties in specific industries. In steel, shipbuilding and the automotive industry the shift in trade flows in the OECD area has been influential. For textiles and clothing, footwear, household electrical appliances and television sets, the growth of exports by the industrialising and developing countries has been the major factor.

. The neo-protectionism makes less use of the traditional technique of unilateral imposition of quotas and customs duties, and gives preference to other forms of action such as bilaterally or multilaterally negotiated trade restrictions, or erection of non-tariff barriers like administrative regulations specific to certain products.

. Besides the measures linked more or less directly with trade itself, there are a great many forms of government intervention such as employment subsidies, tax exemptions, State holdings in firms etc.

The conjunction of these three characteristics emphasises the extent to which neo-protectionism is a form of response by the advanced industrial societies to the challenge of the pressures for structural adjustment. In this regard it is both an expression of existing rigidities and a possible starting point for new rigidities.

A few examples will help to outline the situation.

. Australia, Canada, the European Economic Community, Finland, New Zealand, Norway, Sweden, Switzerland and the United States in recent months have introduced or tightened import restrictions in the form of quotas, import authorisations or duty increases for a whole range of products: fabrics and yarns, gloves and shoes, paper and paper products, freezers, television sets, etc. The official justification, under Article XIX of the GATT, has been the need to protect certain activities from a real or potential disruption of their markets by imports from low-cost countries.

. At the same time, negotiated agreements that restrict trade are on the increase. The Noordwyk agreement of the 50s, the international agreement on cotton textiles of 1961 and the Multifibres Arrangement of 1973 are now seen to have been the precursors. But whereas the 1973 arrangement allowed a 6% annual growth in the volume of exports of textiles and clothing by the countries concerned, the agreement covering the period 1978-1981 is much more restrictive for certain products. While retaining the old annual rate of growth for imports, the new rules leave the importing countries considerable latitude to set lower limits by way of bilateral negotiation. On the basis of the recent export-restricting agreements between the EEC or the United States and Hong Kong, Korea and Taiwan, it appears that the new rules will result in a growth rate of less than 6% for clothing and textile imports by the main developed countries (1). Although negotiated in the framework of the GATT, the textile agreements stem more from protectionist policies than from trade liberalisation policies. And the adjustment problems of the textile industries in the OECD countries are as present as ever.

. Another form taken by neo-protectionism is that of voluntary export restraints, which originally were a major element of trade relations between Japan on the one hand, and the United States and various European countries on the other. These restraints applied to electronic components, television and radio sets, calculators, steel, motor vehicles, motor cycles and ball-bearings, and most of the time were accepted under the threat of unilateral measures. They now make their appearance frequently in relations between industrialised and developing countries. Such is the case with the orderly marketing arrangements concerning footwear which the United States concluded with Korea and Taiwan in 1977. The EEC is negotiating agreements of this kind with the developing countries in respect of products other than textiles and clothing. According to unofficial estimates, the volume of trade affected by voluntary export restraints (excluding those products covered by the Multifibres Arrangement) was already in excess of $2 billion in 1976 (2).

. Regulation of the international steel market is another interesting case in point. Since the beginning of 1978 the United States and the EEC have set trigger prices for many steel products. These prices are calculated by adding transport costs and other outlays to the product costs of the most efficient producers (at present the Japanese). Imports at prices that are lower than the trigger prices by a certain amount are subject to anti-dumping duties. The American measures chiefly affect exports from Japan and the EEC, although the first investigations into possible infringement concerned producers in Spain, Poland and Taiwan. The EEC measures mainly concern imports from Japan, but also those from Austria, Spain, Sweden, Poland, Romania, Bulgaria and East Germany. Third World producers such as Korea, Brazil, India and Mexico have been only secondary suppliers and hence not markedly affected, but in the long term things might be quite different if they try to expand their exports to the OECD. Since the imbalance in the steel market is not purely cyclical (1), temporary measures to organise trade may, as with textiles, become long-term ones.

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(1) Cf. Bela Belassa: The "New Protectionism" and the international economy. Journal of World Trade Law, Vol.12, No.5, 1978 pp. 414-415

(2) Cf. Ingo Walter, Tracy Murray, Wilem Schmitt: Alternative forms of protectionism, quoted in UNCTAD: Growing protectionism, op. cit. p.6

These examples clearly show the important influence which neo-protectionism may have in the long run on productivity structures in the OECD countries. Naturally, its effects combine with those from horizontal and sectoral governemnt aids to industry. The horizontal aids commonly concerned are employment subsidies, preferential credit or tax terms and export incentives. The sectoral aids concerned include some of the above horizontal aids where they are applied to specific firms or industries, and also the take-over of insolvent firms, financing of their deficits, compensation of losses of State-held companies out of public funds. Although it is very difficult to gauge the growth of government intervention in this field, the available figures for public subsidies to enterprises indicate their growth as a percentage of GDP from 1960 to 1976 in all OECD countries, with a marked acceleration since 1970 (2).

Neo-protectionism and the structural adaptability of the developed countries

For the advanced industrial societies there is a grave risk of their being unable to shake off certain forms of protectionism once the process has been set in motion, and of their having to suffer all the adverse consequences in the long term.

In the aftermath of a severe recession that has caused the emergence of considerable slack in the developed economies, and in the absence of any real international economic cooperation, it is very difficult for governments witnessing the collapse of certain industrial sectors and rising unemployment in certain areas not to resort to protectionist policies, for they are effective in the short-term and may prevent social outbursts.

But there is a grave danger of not being able to shake off certain forms of protectionism once the process has been set in motion, and of having to suffer all the adverse consequences in the long-term.

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(1) Cf. the section on the steel industry in Part V.

(2) Cf. R. Blackhurst, Nicolas Marian, Jan Tumlir: Adjustment, trade and growth in developed and developing countries, op.cit. Annex, Table 1.4 and note 44.

Let us take a look at those consequences. They are of two kinds, since neo-protectionism has, on the one hand, essentially the same effects as traditional protectionism and, on the other, specific effects that are liable to be more dangerous.

The traditional effects of neo-protectionism are :

- Structural adjustment is hampered. If the respite it achieves is not turned to advantage to restructure the ailing sectors in depth, efficiency, growth, employment and monetary stability will all suffer in the long run.

- The burden of adjustment is passed on to other countries; it exports unemployment and forces the trading partners to adjust their capacities more drastically.

- It carries the seeds of a chain reaction at national level in two ways; the introduction of measures to support one sector legitimises demands from others; the rise in the cost of production inputs caused by protection of industries that produce them diminishes the competitiveness of those that consume them.

- It also carries the risk of a chain reaction at international level. The phenomenon is too well-known for it to be necessary to describe its workings.

The specific effects of neo-protectionism are as follows.

- Much more than changes in customs duties, neo-protectionist measures are often simply the result of ad hoc decisions by national or even provincial authorities. Sometimes they do not even take the form of government measures, like the voluntary export restraints negotiated between producers in two countries.

- It is often a means of evading established international rules, like those of the GATT, and so getting round internationally accepted guarantees.

- It tends to substitute bilateralism for multilateralism. For example, the Multifibres Arrangement, though negotiated multilaterally, in fact constitutes a framework for bilateral operations.

- Finally, neo-protectionism concentrates economic powers in the hands of central governemnt officials and politicians, and "is perhaps the major consequence for our societies of the ever more selective interventions". (1).

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(1) Assar Lindbeck: Economic dependence and interdependence in the industrialised world, in OECD: From Marshall Plan to Global Interdependence, Paris 1978.

Overcoming these rigidities without forsaking legitimate objectives must be an ingredient of strategies for adaptation to change.

This review of future rigidities illustrates the other aspect of structural adaptability on the part of advanced industrial societies. An endeavour to surmount these rigidities without forsaking the legitimate objectives to which they are often attributable clearly has to be one of the price ingredients of those societies' strategies for adapting to change.

5. STRATEGIES FOR ADAPTATION TO CHANGE

The interdependence of values, growth and structural adaptation prompts two questions:

- *Are the advanced industrial societies going to experience long-lasting internal crises?*
- *Are the economies of the advanced industrial societies going to become increasingly incompatible with one another?*

These questions constitute the premise on which to discuss their strategies for adaptation to change.

We have tried to discern the possible paths of evolution of the advanced industrial societies by examining three phenomena: the trend of values, the intensity of economic growth and the dialectic between pressures and rigidities for structural adaptation. But they are simply three facets of the same reality. It is now necessary to show how these three phenomena are interdependent:

. First, at the national level, where ultimately the question is whether the advanced industrial societies are going to experience long-lasting internal crises (1).

. Secondly, at the international level, where the established diversity of these societies from the simultaneous standpoints of values, macro-economic constraints and structural adaptability may give reason to fear an increasing incompatibility of their economies.

With this complex reality as a premise, we shall attempt to discuss strategies for adaptation to change.

(a) Interdependence of values, growth and structures at national level. Are the advanced industrial societies the seat of long-term crises?

The complex relationships between values, growth and structures make any linear view of future development untenable.

For about twenty years it was possible for the evolution of the advanced industrial societies to be described, in a national context, by economists reasoning mainly in terms of macro-economic growth. Upsteam, the consensus seemed to establish itself on the goal of non-inflationary growth coupled with virtually full employment. Structural changes were profound but easily absorbed and growth made it possible to pursue other goals downstream, notably equality and security.

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(1) The word "crisis" is not of course used here in the narrow sense of a cyclical recession, but in the broad sense assigned to it by historians in the study of long-range phenomena.

The complex relationships between values, growth and structures now make any linear view of development untenable. Values are changing radically, even if the changes are slow and of the greatest possible variety. The legitimacy of growth as a goal in itself is questioned by some, and it is running foul of structural rigidities. Influenced by growth, changes in structure are accelerating or curbing certain trends in values. Consequently, one of the difficulties for governments is the fact that problems are dealt with in isolation and not enough account is taken of their interdependence, or that they are considered solely from the short-term standpoint without their long-term implications being introduced. The danger, therefore, is that of a long-term persistance of moderate-growth scenarios of the B2 type, with aggravation of rigidities and consequent reduction of growth and, in prospect, political and social destabilisation of the developed countries.

The earlier analyses suggest various examples of possible chain reactions involving values, growth and structures. Let us look at one of the many possibilities in its three stages.

- Even if there are vast opportunities for innovation in many fields, prolonged low growth may cause a fall in R&D investment, resulting in a slowdown in technological progress and in long-term productivity growth rates.
- Because of the low level of investment, production capacities may prove insufficient to permit a return to full employment and sustained non-inflationary growth, even in a medium-term perspective. Accordingly, a long-lasting combination of inflation and unemployment cannot be ruled out.
- The existence of considerable underemployment might have an impact on attitudes to work. In particular, the persistance of youth unemployment may sap the morale of young people, reduce their ambition and diminish their interest in education and training, since they cannot hope to find jobs which are commensurate with their efforts. Since they represent the society of the future, the social, economic and political implications of this problem may be considerable.

At a deeper level, the difficulties analysed might betoken a more general crisis revolving around values and the organisation of society.

This poses a question. Over and above the cyclical impact of the 1975 recession, are the advanced industrial societies now the seat of long-term internal crises extending well beyond the economic context? The answer is largely a matter of personal opinion. The INTERFUTURES analysis nevertheless identifies a number of "trouble spots" that seem to be central to the conflicts specific to the developed countries. Basically these trouble spots have to do with values and the organistion of society.

. First, values. It is difficult, admittedly, to assess a trend that differs according to individuals, generations, sexes, social groups, ethnic groups and countries, and the first section of this part of the report has shown just how varied the phenomena are. It is possible that there will be differentiated change with a separation of sentiments between numerous minorities and a middle majority which itself is rather heterogeneous and shifting. Such a separation would be a source of complexity and instability as it would increase the number of goals pursued by society and provoke conflicts between them. It would lead to a questioning of traditional growth without acceptance of the new type of growth, it would strengthen existing rigidities and at the same time the desire for a new organisation of society. It is of the utmost importance, therefore, that thorough and comparative studies on the evolution of values in the advanced industrial societies should be carried out.

. Second, the organisation of society. The institutional aspects of the problems of advanced industrial societies must not be underestimated. They have emerged again and again in this third part of the report, in three contexts.

- Social oligopolisation: the various social groups (farmers, doctors, ethnic minorities, businessmen in a given industry etc.) tend to organise themselves on a continuous basis so as to be able to lead from strength in negotiating with parliament, the government, the local authorities or the other organised groups. This is an institutional structure which can be held largely accountable for continuing rigidities, spreading inflation, insufficient international cooperation, and so on.

- The difficulties of the two major institutions for the distribution of goods and services: the market and the Welfare State. On one side, there is a school of thought which argues that the market anticipates the future inadequately, neglects external economies and is not adapted to the distribution of numerous non-market services. On the other, there are those who criticise the Welfare State for the inadequacy of its regulating mechanisms, and claim that it results in an excessive growth of non-market services, maladjustment of those services to individual needs and greater responsiveness to pressure groups than to the effective demands of the majority.

One of the future problems for governments of advanced industrial societies will therefore be not only to use these two institutions in such a way as to get the best out of each, but also to improve the functioning of each. Market mechanisms have a capacity for fine-tuned adjustment and innovation that is irreplaceable, and their defects can be reduced by means of suitable corrective signals. As to the Welfare State, its role is inevitable.

but closer links between decision-makers and users might serve to restrain expenditures and improve their adjustment to requirements.(1) Furthermore, an associative non-market and non-government sector might emerge, in symbiotic union with these two institutions, which would produce certain services that neither the governments nor the market can provide efficiently.

- The difficulties of the political institutions. Because of the direction taken by this report, these difficulties have remained somewhat in the background, but they have been touched on time and again from many different standpoints: the difficulty of co-ordinating the increasingly diverse activities of governments; difficulty of controlling the growth of government bureaucracies; ineffectiveness of parliaments; conflicts between the central authorities and regional or local authorities; conflicts resulting from demands for decentralisation and participation. Two aspects of these difficulties concern this report very specifically.

. The problems posed in a democracy by the relative weights assigned to the short, medium and long-term by citizens who seemingly tend to concern themselves mostly with the short-term and to leave the care of the long-term interests to the government, whilst the latter can pursue long-term goals only to the extent that this does not compromise its chances of re-election (2).

. The problems posed in a democracy by co-ordination of domestic policies with international policies, when citizens tend to underestimate seriously the fact of economic interdependence of nations (3). This is a finding that brings one back to D. Bell's observation that governments seem to have become too big for the little problems and too little for the big problems.

(b) Interdependence of values, growth and structures on an international scale. Are the economies of the advanced industrial societies going to become increasingly incompatible with one another?

The international context adds its own complexity to internal independences. After the Second World War life-styles drew closer together and the American way of life was a common aspiration of the populations of the other OECD countries. Freedom of trade made the structures of the advanced industrial societies more and more homogeneous. Fixed exchange rates, made possible by the conditions under which the world economy was functioning, facilitated a management of growth that was both compatible with balance of payments equilibrium and close to full employment.

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(1) Cf. the example of health services.

(2) Perhaps because the long-term has assumed considerably more importance in the last few decades.

(3) Perhaps because of the rapidity with which this interdependence has grown.

This simple and consistent picture of the evolution of the OECD countries does not reflect the realities of the last few years, which have seen the beginnings of divergences likely to make the OECD countries more heterogeneous from now on and perhaps increasingly so. It is now proposed to examine the available indicators in this context, yet with a degree of caution since INTERFUTURES was unable to study each and every one of the OECD countries from the triple standpoint of values, macro-economic constraints and structures.

Where values are concerned, the parallelism of many trends as between Japan, North America and Western Europe is admittedly striking, but in the complex and unstable situations that are emerging the likelihood of divergent choices is growing. So in all probability certain countries will decide against nuclear power whilst others will actively pursue their programmes. Will this not give rise to problems between them when oil shortages occur in the future? More generally, if the trade-offs made between the "new-type growth" of scenario B1 and the more traditional growth of the B2 scenario differ too much from one country to another, there will be distortions between the price systems desired at national level and the international price system. Consequently some countries, in order to safeguard their choices, may be led to adopt directly or indirectly protectionist policies in their foreign trade.

As to the diversity of the macro-economic constraints on the different OECD countries, this is now quite evident. In the early seventies, the beginnings of the recession were similar in most developed countries. Inflation accelerated sharply between 1970 and 1973 whilst productivity of labour slowed and that of capital stagnated or declined. However, when the system of fixed exchange rates broke down and the oil crisis struck the OECD countries, their structural positions were not the same, both in the domestic context and in that of international trade. The general growth that marked the previous decade had in fact concealed quite appreciable structural differences, the presence of which was to be largely responsible for the very divergent macro-economic trends in the industrial countries from 1974 to 1978. Although general, the slowdown in growth was more pronounced in some countries than in others (1) and reactions in terms of prices, exchange rates and trade balances were different, to say the least. As regards those countries with resilient export structures (2), the deflationary effect of the counter-inflationary action successfully undertaken as from 1973 by Germany and as from 1974 by Japan was offset at the level of real income by a fall in import costs due to the steady appreciation of the two currencies under a system of floating exchange rates. For other countries with weaker export structures and often a higher import elasticity in relation to GDP, the floating exchange rate system put heavier pressure on the national currency and aggravated induced inflation. The negative effects of a fall in parity appeared before the positive effects on competitiveness could make themselves felt. Short-term capital movements also increased balance of payments fagility. The United Kingdom is very much a case in point. For countries with vulnerable trade structures, the question is one of improving competitiveness through higher domestic productivity, but higher productivity implies an effort to achieve higher growth with an increased risk of inflation or it means more unemployment.

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(1) Between 1974-77 and 1969-73, the fall in average annual growth was 0.3% in the United States, 4.7% in Japan, 2.5% in Germany, 2.8% in France, 3.2% in the United Kingdom and 2.8% in Italy.

(2) i.e. a high elasticity of volume exports relative to prices in foreign currency terms.

The OECD countries have adjusted to these differences in situation by macro-economic responses, but it may be asked whether they are not generating disparities in medium-term growth potential that might compromise the assumption of convergence built into scenarios A, B1 and B2.

Finally, the battle between pressures and rigidities often differs in its characteristics from country to country. Differences of structure in certain industries (e.g. textiles and shipbuilding) are making some countries more vulnerable than others to the emergence of newly industrialising countries, whereas similarity of structures and ambitions in many other industries is making their economies much less complementary than in the past. Furthermore, the labour market seems to be much more adaptable and real wages much more flexible in North America and Japan than in some countries of Western Europe.

So it is not surprising if the responses to problems of structural adjustment differ appreciably from one country to another. Whereas some champion free trade, others have above-average recourse to neo-protectionist measures.

These findings lead on directly to the analyses in Parts IV and V. Here too, the challenge presented to governments is the management of interdependence from the short, medium and long-term standpoints. Here, too, it is possible to imagine chain reactions involving a progressive increase in protectionism and leading both to a more pronounced slowdown of growth than in the B2 scenario and to a fragmentation of the external relations of the advanced industrial societies.

(c) Possible strategies for adaptation to change

Each of the three strategies hinted at in the analysis (absolute priority for growth and adjustment; defence of existing structures; acceleration of the economy and society's evolution in accordance with new values) carries grave potential dangers.

Restricting the context to the domestic problems of the advanced industrial societies, three extreme strategies are hinted at in the preceding analysis.

. A strategy of absolute priority for economic growth and structural adaptation. Recognising the magnitude of the needs that can only be filled by an increase in national income, this strategy would set out to stimulate final demand and notably private investment, while restraining real wages and social insurance costs. At the same time it would attempt to reduce the existing rigidities through a more flexible functioning of the labour market, a narrowing of the scope of government regulatory policies, a limit on public spending and a minimum of additional schemes for redistribution between individuals, social groups or regions. On the international level, cooperation would aim mainly at maintaining an open system of international trade and reducing exchange rate fluctuations.

. An essentially defensive strategy designed to cushion the social repercussions of the international economic situation. Acknowledging the depth of the structural adjustments required of the advanced industrial societies, this strategy would seek first and foremost to protect the individuals belonging to the various social groups. It would give anti-unemployment measures priority over growth. It would accept a rise in public expenditure in order to maintain incomes. It would not exclude certain forms of neo-protectionism. At the international level, it would support the establishment of a system of international trade that would make the structural adjustments more tolerable.

. A strategy aimed at accelerating the evolution of the economy and of society in accordance with new values. Based on the conviction that these new values would become dominant, this strategy would now set out to adjust structures accordingly. It would buy acceptance of a reduction in growth with a redistribution of incomes. It would encourage decentralisation and the development of the informal sector and the "third system" (1). It would try to distribute jobs offered among job-seekers. It would offer strong incentives to conservation of energy and raw materials. It would strengthen protection of the environment. At the international level, it would advocate increased assistance to the developing countries, while not hesitating to resort to certain protectionist measures to permit the development of a "blueprint of society" which might not be acceptable to the OECD countries as a whole.

Yet the fact must be faced that each of these three strategies carries grave potential dangers.

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(1) As elaborated on p. 111

. The danger in the first strategy is that inequalities would become more pronounced in two ways. In the short-term, because of the prejudice suffered by those who lose their jobs; in the long-term, through the formation of groups of growth outcasts (ethnic minorities, urban underclass, inhabitants of declining regions) who are excluded from the benefits of growth. The first phenomenon may cause social outbursts, especially in fragile countries, whilst the second might insidiously pave the way for an extension of an underdevelopment that would progressively undermine the possibilities of growth.

. The danger of the second is sclerosis, the withdrawal of society into itself and the rejection of a positive response to the challenges of the future. Admittedly, in the short-term, the adaptation process is slowed down and social life facilitated, but in the long-term the pressures become so great that only two solutions remain: acceptance of changes in much tougher conditions, or increased isolation.

. The disadvantage of the third is that it represents a premature utopia: there would be an exacerbation of disagreements between the groups voicing different demands, with the result that it would be necessary to impose changes corresponding to the strategy.

So, what could be the answer?

It will probably be necessary to combine policies deriving from the three strategies. This would mean :
- *restoring growth;*
- *accepting the need to adapt;*
- *rejecting conditions favouring the existence of growth outcasts;*
- *giving temporary status to measures designed to make adaptation tolerable;*
- *being receptive to the demands of the groups likely to ...*

Probably to combine, but in a certain way, policies deriving from the three strategies. Such policies will never be spelled out in formal terms. They will be shaped in each country by the continuing social debate and by the balance of power among the groups concerned. But as a contribution to that social debate, it is at least possible to put forward six guidelines suggested by the work of INTERFUTURES;

(1) To restore economic growth and acknowledge clearly that its continuation constitutes a legitimate goal of the governments of developed countries. It conforms to the aspirations of a large proportion of the population in those countries, it should not encounter long-term physical limits and it should not compromise the development of the Third World (1).

Such an acknowledgement (backed by concrete measures in such varied fields as development of energy production, furtherance of research in key sectors, possible reform of methods of financing social expenditure, etc.) is likely to cause economic agents progressively to alter their attitudes to investment and the long-term.

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(1) Cf. on this subject, the analysis in Part Iv.

...shape the future;
- helping to build up a system of international cooperation.

(2) To accept the need to adapt and consequently to attack the rigidities in the advanced industrial societies, and where such rigidities result from the pursuit of social goals, to investigate ways of achieving these same goals without generating perverse effects. Here it is amazing to note the lack of "prospective analysis of laws" in developed countries, i.e. a study of the indirect effects of government measures. More generally, a policy of adaptation presupposes a long-term vision of the major problems with which society will be confronted. It is this long-term vision which makes it possible, by way of horizontal measures, to establish the framework in which the initiatives of the economic transactors will define the creative response of society.

(3) To reject conditions favouring the existence of growth outcasts namely those excluded from the benefits of growth, and to regard the participation of all individuals, all social groups and all regions in the process of economic and social development as even more important than income distribution. The fight against rigidities, necessary though it is, must not be an excuse to rein in social policies. On the other hand, those policies should probably be directed less towards assistance as such and more towards increasing the capacity to participate.

(4) To give temporary status to all measures designed to make structural adaptation socially tolerable. And of course to limit them as much as possible in time and space, while giving them forms that contribute least to the creation of additional rigidities. This implies that the measures should be introduced as early as possible, whilst the problems are relatively narrow in scope and hence easier to resolve.

(5) To be receptive to the demands of the groups likely to shape the future, especially when they appear to have a reasonable chance of being progressively adopted by the middle majority; to facilitate decentralisation and participation; to encourage experiments in organisation of society and to contribute thereby to a progressive change in the content of society's output. More generally, to recognise that the economic system, while contributing to the achievement of society's overall goals, must enable each and everyone to fulfil himself to the maximum of his potential as a human being.

(6) To contribute, on the international level, towards building a system of cooperation that will increase the foregoing policies' chances of success. This point will naturally be central to Part V of this report.

To succeed, these policies need public support. But the public is disoriented by inflation and unemployment, by the questioning of values, and by the complexity of the world economy. The more that OECD governments can lead the public to share a constructive vision of the future, the greater will be the ability of those governments to implement sets of consistent long-term policies.

These few guidelines may be of use in the search for solutions to concrete problems.

These few guidelines may be of use in the search for solutions to more concrete problems, such as the following.

- Governments may have to reconsider their social policies as a whole in a context of low growth and new demands (1), to make them more effective and less costly, but also to conceive them in a more global way, with due regard for their impact on the economy and for the entirety of their influence on the social groups concerned.

- Whether in the case of intervention on markets or in that of distribution of public services, governments will have to concern themselves even more than in the past with the perverse effects that their decisions are liable to generate.

- In seeking to combat unemployment, care must be taken to avoid turning fixed costs at national level into charges that increase the marginal cost of labour for firms; minimum guaranteed earnings have to be manipulated with caution; unemployment benefits should be conceived as a means of facilitating transitions and not of providing permanent assistance.

- In the conduct of their industrial policies, governments should not only react to short-term difficulties as they arise, but try to anticipate them as far as possible and to create the conditions for a continuous adjustment to comparative advantages that will be in a constant state of flux.

- Governments may also find it in their interests to tackle the psychological aspects of these problems, notably :

. By developing social indicators describing more precisely the improvements in the quality of life in the main OECD countries and permitting a more accurate assessment of the real degree of under-utilisation of the factors of production.

. By restoring confidence in the long-term opportunities for growth and in the profitability of investment.

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(1) Cf. OECD: Manpower and Social Affairs Committee: International Conference on Social Policies in the 1980s, 1978.

. By making the public aware of the nature of the economic and social choices facing the developed countries.

. By emphasising the direct and indirect benefits that come from integration of the world economy.

. By spreading information about trends in the other countries of the world.

Yet judicious national strategies alone are not sufficient to ensure a harmonious evolution of the advanced industrial societies. It is also necessary to establish new forms of cooperation between developed countries and between them and the developing countries, together with suitable management of global interdependence in all its aspects.

PART IV : THE ADVANCED INDUSTRIAL SOCIETIES AND THE THIRD WORLD

Relations with the Third World are the second big challenge the developed societies will have to face.

Relations with the Third World represent the second of the major challenges with which the developed societies will have to contend. The main problems involved can be assessed best by means of a systematic approach: following the discussion of the internal evolution of the developed societies in Part III, a corresponding effort must now be made to understand the dynamics peculiar to the developing societies, and then to analyse the interrelationships between the two groups of societies - the influence of the North on the South and the impact of the South on the North. However, the heterogeneity of the Third World calls for an approach to its development prospects based on the reality represented by national societies, for the strategies open to the advanced industrial societies with regard to the Third World must be discussed on the basis of a twofold understanding of the Third World's tendency towards increasing homogeneity but also increasing differentiation. The sections of Part IV follow naturally from the above (1).

After setting out a few facts illustrating the homogeneity and the heterogeneity of the Third World, this part of the report analyses the long-term problems and prospects for the developing regions, attempts a field-by-field assessment of the scale of interdependence between developed and developing societies, and finally discusses the strategies that might be envisaged by the developed country governments.

(i) to begin with, a few facts to illustrate the homogeneity and heterogeneity of the Third World in its past development and its present state;

(ii) next a region-by-region, and sometimes country-by-country analysis of its long-term development prospects to spotlight the crucial question for all developing countries, namely the choice of development strategy;

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(1) The dollar figures quoted are in 1976 US dollars unless otherwise indicated.

(iii) a field-by-field assessment of the nature and scale of interdependence between developed and developing societies, allows an estimate to be made of the possible effects of their respective policies;

(iv) it is then possible to discuss the aims and content of the strategies that may be envisaged by the developed country governments.

Mention must be made, however, of two obstacles which increase the difficulty involved in this approach:

. The first is the immense complexity of the evolution of the developing world. Consequently any aggregate view of its future prospects will be extremely simplied.

. The second obstacle comes from the Western ethnocentrism with which analysis of development processes is still deeply impregnated. Admittedly, it has become a commonplace to say that the development of the Third World does not consist of imitating or simply catching up with the West, but while the trap can be avoided on the general ideas level, it becomes much more subtle where concrete development strategies are involved.

One of the conclusions that emerges is that it is in the interests of the developed countries to devise active and global strategies with regard to the developing world, strategies which should be based on a broader conception of North-South relations than hitherto.

A certain number of conclusions will gradually emerge in the course of the analysis. The first of these is that it is in the interests of the developed countries to devise active and global strategies with regard to the developing world. While displaying the necessary tactical flexibility demanded by short-term considerations, the developed countries must base these strategies on an analysis of their probable long-term effects on the advanced industrial societies, on the developing countries and on the world economy as a whole. Furthermore,:

. The developing world will become very differentiated over the next twenty-five years; countries with populations totalling more than half a billion will have caught up with the industrial nations, while the others which comprise the bulk of the population of the Third World (excluding China) will still be underdeveloped, despite the progress achieved. China will have become an important part of the world economy.

. The conceptual and physical efforts of the Third World to produce new development strategies will be of increasing importance, even for the developed countries. Past development experience shows the inadequacy of conventional development strategies as actually applied, above all (though not only) in the poorest countries. These strategies have often led to critical situations from the triple standpoint of :

- the volume of absolute poverty;
- the extent of income disparities;
- the lack of independence in national economic choices and in the nature of foreign relations.

. Because of increasing interdependence, the Third World's evolution and choices will have a growing influence on the economics of the developed countries.

The differentiation of the Third World, the search for new development strategies and increasing interdependence should therefore induce the developed countries to adopt a concept of North-South relations broader than the traditional concept, which saw them only from the standpoint of integration in the world economy via the market and by means of investment facilitated by development assistance policies. Thus, the developed countries will have to adopt a multilateral approach in order to take account of the differences in situations between groups of countries, and a global approach in order to participate in the gradual evolution of the international economic system as a whole.

1. THE HOMOGENEITY AND HETEROGENEITY OF THE THIRD WORLD

The need for a dual view of the Third World will persist well beyond the end of the century.

The message of the last twenty-five years has been the need for a dual view of the Third World. This will be the starting point of the prospective analysis. It will be seen, moreover, on its completion that this major characteristic will persist well beyond the end of the century, so that it constitutes a basis of reflection for considering the strategies of the developed countries.

The Third World is defined first by the nature of its relations with the developed countries. From that standpoint there is a certain homogeneity ...

Three centuries ago, an observer would have been struck by the diversity of the non-European world. It was the industrial revolution which, by engendering the success of the Western civilisation in terms of resources and power, gave a degree of homogeneity to this area which, only 100 years ago, was so disparate as regards the content of its great religions, the scale of its political structures, and the dimensions of its cultural message. Whence a fact which is self-evident, but which is not unimportant for political thinking: the Third World is defined in relation to the developed countries much more than in relation to itself; it comprises all the human societies which could not or did not want to adapt to the shock imparted by Georgian England and which, as a result, now display common characteristics both as to their present reality and in their dynamics.

... in the present characteristics of the Third World and ....

From the outside, a few statistics suffice in order to apprehend certain present-day factors.

. If one takes as a dividing line between the North and the South the countries with a per capita income in 1976 of US$ 2,200 - 2,900, the separation is almost perfect. Only Portugal, Turkey and Romania on the OECD and COMECON side, and Saudi Arabia, Libya and Kuwait on the OPEC side lie clearly behind or beyond this frontier.

. Of the 85 countries with per capita incomes of less than $1,400 in 1976, 75 had annual population growth rates of at least 2% between 1970 and 1976, whereas the rate did not exceed 1.4% in any industrialised country inthe East or West, and the average was under 0.8%.

. In 1976 the share of agriculture in national income averaged 45% in countries with per capita incomes of less than $250, compared with 21% on average in countries with per capita incomes ranging between $250 and $3000, and only 6% in the industrialised OECD countries.

. Where per capita incomes are less than $800 (with the exception of Sri Lanka), life expectancy at birth is between 35 and 62 years, whereas it is over 70 in all the developed countries of the East and West.

These figures are a partial reflection of more profound social and political similarities which have often been described in recent years and which usually involve an imperfect syncretism between the traditional culture and Western culture, the disparate heritage of a colonial period, the co-existence of two economic structures, enormous inequality of conditions between groups within each country and, lastly, asymmetrical economic and political relations with the two major developed areas formed by the West and the East.

...in the dynamics of the developing countries, which have undergone the biggest upheaval in their whole history during the past quarter-century.

However, as we already know, nothing would be more fallacious than to confine ourselves to static observations, because the Third World has undergone the biggest upheaval of its whole history in the space of the last 25 years. Decolonisation, the population explosion, economic growth, and relations with the North have combined to transform social structure. Acknowledgement of this vast process explodes two assertions which were often part of the propositions commonly accepted in the 1960s :

. The first reduced the problem of the Third World to that of just a time-lag compared with the developed economies, a time-lag which could be made up by imitating the growth process used by the industrial countries since the 19th century. Development strategy had to be centred on maximum growth of production by means of capital accumulation and industrialisation, the social requirements of the whole population being automatically satisfied as a result of the increase in overall production. However, there are many developing countries where increased national income has not led to any improvement in the situation of huge sections of the population. The 800 million people at present living in a state of absolute poverty and unable to meet their basic needs are living proof of the inadequacy of any concept of development which does not see it as a global social phenomenon.

The second assertion limited the international economic system to a set of relationships which were neutral in terms of power implying complete effectiveness of the market and the opportunity for the Third World economies to benefit fully from the locomotive effect of the developed economies. However, whether one is considering industrialisation, agricultural development, raw material exploitation, financial flows or the imitation of life-styles, the countries of the North have had a lopsided influence on the Third World, with both beneficial and harmful effects, so that internal and external factors are inextricably combined in the Third World as it is today.

Recent studies have therefore been right to emphasise the importance for the Third World of the whole system of relations with the developed countries. Taken in this sense, the notion of an international economic order acquires its full significance.

But the other side of the coin is the Third World's growing differentiation. There are now wide inter-country differences in:

However, an analysis of the Third World which only considered its homogeneity would be ignoring the other side of the reality, i.e. the growing differentiation within this vast unit, a new differentiation superimposed on the old background of historical differences.

Over and above the obvious diversity of historical heritages, social structures and political institutions, there are five significant features which will make it possible subsequently to outline a relatively simple typology of the developing countries:

- population size;

1. Great diversity of population sizes, ranging from hundreds of millions in the continent-countries to a few hundred thousands in the island-States or small countries in the Balkanized continents. Whence the widely varying potential capacity of the governments of these countries to control the development of their societies or the relations with the outside world.

- average per capita national incomes;

2. An enormous disparity of average per capita national incomes: 34 very poor countries, ranging from Bhutan to the Yemen Arab Republic, have a combined population of 1.2 billion people with average incomes of between $70 and $250 in 1976 (the World Bank's low-income countries); 31 others, ranging from Togo to Paraguay and including China, have per capita incomes of between $250 and $650, again for a population of 1.2 billion people; lastly, 27 others, ranging from South Korea to Singapore, have average incomes of between $670 and $2,700 for a total population of 440 million (1).

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(1) Figures worked out on the basis of the World Development Report 1978, World Bank, 1978. The OECD and COMECON countries, Israel, Saudi Arabia, Libya and Kuwait are excluded. Included on the other hand, are the centrally-planned developing countries.

- economic growth rates;

3. Considerable disparities in economic growth over the last 15 or 25 years. Between 1960 and 1976, the growth of per capita income was below 1% per year, or was negative, for 23 countries with an overall population of some 250 million; it was between 1 and 2% for 15 others (including India) with a total population of 775 million; it was between 2 and 4% for 650 million people in 36 countries; lastly, China on the one hand, and 12 other countries with an overall population of 260 million on the other, have achieved annual per capita growth rates in excess of 4% (1).

Still more important, however, is that in the World Bank's two-class division into low-income countries and middle-income countries (2), the annual growth rate in the former over a 16-year period was 0.9% and in the latter, 2.8%. The first group will comprise 2 billion people by the year 2000, and the second 1.5 billion. Consequently, the per capita income gap between the two groups of countries in the Third World is widening.

- internal income distribution;

4. Pronounced differences in the internal inequality of income distribution. In some countries, a rich minority co-exists with a relatively poor population mass as in Brazil, while in others, such as Taiwan, distribution is much less unequal. This is no doubt why some countries have indicators concerning life expectancy at birth, infant mortality and level of education which are much higher than their average income would suggest (Sri Lanka, for example). Above all, existing research on the relationship between economic growth and income distribution has not revealed any clear correlation between the two phenomena. It is no longer possible to maintain the belief that economic growth systematically produces favourable effects on income distribution. Hence the importance of the trend in the numbers and geographic breakdown of those who will be living in absolute poverty, the "heirs" of the 800 million who are at present mainly concentrated in South Asia, Indonesia and Sub-Saharan Africa.

- availability of natural resources.

5. An immense disparity in the availability of natural resources capable, when exploited, of procuring the imports needed for development. The case of the OPEC countries is an illustration of how much the growth of the world economy over the last 25 years has increased the importance of this factor.

Thus, the wide differences between groups of Third World countries caution against adopting too global an approach to North-South relations.

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(1) Figures worked out on the basis of the World Development Report 1978, World Bank, 1978. The OECD and COMECON countries, Israel, Saudi Arabia, Libya and Kuwait are excluded. Included, on the other hand, are the centrally-planned developing countries.

(2) The World Bank does not include China in this classification. For a precise definition, see "World Development Report", op.cit.

The respective long-term consequences of growing homogeneity and differentiation will depend both on the development strategies of Third World countries and on the way in which developed and developing countries manage interdependence.

But how will increasing differentiation and homogeneity interact in the long term? The answer depends on two vital questions which clearly emerge from this composite vision of the Third World:

1. The first concerns the developing countries themselves and their choices of internal development strategies. History has taught us that nothing can replace a society's will to adapt and survive.

2. The second concerns both the developed and the developing countries, and has to do with the way in which they manage their interdependence. Differently expressed, this is a reference to the problem of the structure and functioning of the international system of relations.

2. PROBLEMS AND LONG-TERM PROSPECTS FOR THE THIRD WORLD COUNTRIES

In order to define the possible futures of the Third World, it is necessary to start with the regional and national realities, and from them try to deduce the overall prospects.

The only way in which to define the complex possible futures of the Third World is to start with the regional and national realities - of South Asia, the Far East, Latin America, North Africa, and the Middle East Sub-Saharan Africa and, lastly, China - and then try to deduce the overall prospects. To describe the problems and possible trends of a continent or society in just a few pages is obviously a gamble and implies many inadequacies; however, the risks are no doubt less serious than those involved in a global and undifferentiated analysis since it is possible to refer constantly to the choices of development strategies made by the chief parties concerned, which are the peoples and governments of the Third World.

INTERFUTURES takes sole responsibility for the contents of this section.

One important point must be made, however. This section on the prospects of the various countries and regions is the sole responsibility of INTERFUTURES. It does not commit the developing country experts who took part in the project, still less the OECD Secretariat as a whole. Moreover, what is important is not so much the details peculiar to each country as the construction of an overall vision from individual visions.

The range of development strategies

The future will probably bring even more variety than the past in the internal development strategies chosen by the various Third World countries. Much more than simple government decisions, the choice of these strategies will moreover be the result of socio-political processes which will sometimes be marked by revolution, and in which internal and external factors will interact.

The harsh constraints to possible actions will shatter many hopes, yet tomorrow's decision-makers will draw their inspiration from all the past experience and present thinking of the élites of the Third World. This thinking, which either extends or rejects the strategies of the last 25 years, involves three major types of development strategy.

A first group belongs to the conventional approach: development, in conjunction with the growth of per capita national income, stems from the accumulation of capital, integration in the world market and industrialisation. Such strategies are pursued by countries as different as Brazil, Morocco, Algeria, the Ivory Coast, Singapore, South Korea and Pakistan. Naturally, many alternatives exist which depend on economic organisation and industrialisation policies:

- the private sector and transnational companies can play a major role in economic life, as in South Korea; they can exist alongside State enterprises, as in Brazil; or the economy can be entirely State-controlled through national companies, as in Algeria;

- industrialisation can be to a greater or lesser extent directed towards import substitution (in which case, however, it may have to contend with inadequate domestic demand, while at the same time increasing the inefficiency of the production system through protectionism and creating external dependence as regards imports of capital goods), towards export growth based on processing raw materials, producing consumer goods or carrying out sub-contracting operations (in which case industrialisation eases balance-of-payments constraints and leads to an industry which is efficient enough, but at the same time makes the country's development dependent on that of the world economy), or towards the construction of an integrated industrial system (however, few countries are big enough and have sufficient resources for such a policy).

However, the experience of the last twenty-five years is causing a growing number of politicians and thinkers to doubt whether the major development problems of the majority of Third World countries can be solved adequately and within an acceptable time horizon by means of these strategies alone. Whence the interest shown in other strategies, whether reformist or radical. They start with different values in which cultural integrity, the national dimension and the requirements of the community play an essential role. They propose different development objectives, of which the foremost include the satisfaction of basic needs, economic independence, cutting down on certain types of consumption, priority for employment, the quest for balanced relations between urban and rural areas, and the importance attached to agriculture.

The distinctive feature of reformist strategies is the new weighting between the objectives of redistribution and growth. Redistribution is to be accomplished by redirecting investment, by a policy of income transfers - through taxation in particular - and by a policy of property transfers (for example, land reform) Three categories of population are the subject of special attention: small farmers, landless farm labourers and the urban unemployed. However, because these strategies represent no more than a very partial challenge to social structures in the developing countries and to the integration of these countries in the world economy, they are obviously liable to come up, inter alia, against power relations between social groups at national level.

Radical strategies have other objectives, the emphasis differing from version to version. Some insist solely on improving the standard of living of the poorer section of the population as rapidly as possible, and covering everybody's basic needs as regards nutrition, housing, health and education. Others, on the contrary, attach priority to self-reliance, both in order to reduce external dependence and to make for a policy more directed towards basic needs satisfaction. Strategies such as this entail greater mobilisation of national resources, the development of national capabilities (as regards technology, in particular) and co-operation with other developing countries (collective self-reliance), but the significance of this self-reliance is still far from clear. Others, finally, focus the majority of their proposals on rural development and its relations with socio-political structures.

It is in the light of these possible choices that a discussion of the national and regional prospects of the Third World takes on its full significance.

Regional prospects: South Asia

South Asia will have a total population of some 1,300 million at the end of the century. This is the region with the most acute poverty problem for essentially internal reasons.

Eight countries are involved(1), three of which contain the bulk of the population. Almost 900 million inhabitants in 1977, and some 1,300 million by the year 2000; a per capita income of $150 in 1976, expected to vary between $220 and $350 at the end of the century. This is a region with four essential characteristics:

. Poverty is a more acute problem in this region than in any other, both because of the extent of the failure to satisfy food requirements and because of the considerable proportion of the population affected by these shortages.

The cases of three countries illustrate the situation in the region ....

. The main causes of this situation (the excessive population pressures, the inadequate creation of income rather than distortions in its distribution and, lastly, the weakness of the system of resource mobilisation) are essentially internal in origin and socio-political in nature - in the broadest sense of the term.

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(1) India, Bangladesh, Pakistan, Burma, Afghanistan, Sri Lanka, Nepal, Bhutan.

. As a result, the impact of external relations will be of only secondary importance for long-term development. Admittedly, aid and transfers of external resources will be necessary to trigger off the development process, especially in the case of the poorest countries, but they will never suffice in themselves (1).

. Lastly, for the time being, the prospects for intra-regional cooperation are very limited because of historical problems stemming from the breakup of an empire, and the national antagonisms underlying the birth of the three major countries of the Indian sub-continent.

... India ...

India had a population of 620 million in 1976, and it will be close to 1 billion by the year 2000. Per capita income, which was scarcely $150 in 1976, will probably be very little over $300 (1976 prices) by the end of the century. Its experience since independence and its present problems are a remarkably good illustration of the regional situation described above. Two types of strategy have been employed successively :

- between 1955 and 1965, a programme was implemented which was focussed on growth and massive industrialisation, particularly in the field of heavy industry, and this programme led to serious imbalances and, above all, insufficient progress in the rural world;

- the last ten years have seen a change of direction favour food production and small industries.

However, the development process is still hampered by three serious obstacles :

. In the agricultural sector, which is still very much subject to climatic uncertainties, the "green revolution" has mainly benefited a minority of privileged farmers, and the increase in the productivity of small farmers remains the essential requirement which can only be met by means of complex measures - themselves necessarily slow and held back by numerous socio-political obstacles.

. As regards industry - where the record of progress is remarkable, since India is now among the Third World's foremost industrial producers (2) and, in particular, has a large capital goods sector - its expansion is now impeded by the weakness of domestic demand, since exports cannot provide sufficient stimulus for an economy of this size. Moreover, because of its choices as regards industrialisation, India has lost the dominant position on the external market that it had in the middle of the 1960s and, while its prospects for exports to the Third World remain favourable in the long-term (in particular for capital goods), foreign trade accounts at present for barely 5% of national product.

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(1) In 1976, South Asia received more than one-fifth of total bilateral and multilateral aid (including OPEC), but this amount represented only $4.8 per person, compared with $5.4 in East and South-East Asia, $25.2 in the Middle East (excluding Israel), $5.5 in Latin America, $11.7 in Sub-Saharan Africa and $29.6 in North Africa.

(2) India was the Third World's leading producer until the early 1970s but has now been overtaken by the three main Latin American countries.

. Finally, the most crucial problem is to mobilise domestic resources both financial and human; but the main obstacles to this appear to be the social structures and the political system.

It is because these are unlikely to undergo any major change in the present circumstances that India's progress over the next two decades will probably oscillate between the relative successes of a reformist and stabilising policy on one hand, and the absence of development and appearance of obstructions and serious disturbances on the other.

In any event, the 300 million people at present living in absolute poverty in India will probably be no less numerous by the year 2000.

... Pakistan ...

Unlike India, with its continental dimensions, Pakistan, with its exceptional geographic location between South Asia and the Middle East, could envisage mainly outward-oriented industrialisation; however, its case demonstrates the limits of such a policy.

First of all, poverty in the two countries is comparable: per capita income of $170 in 1976 which, even with rapid growth, may barely exceed $350 at the end of the century; a rapidly expanding population (70 million in 1976, 135 million in 2000); but, in addition, a particularly archaic socio-political structure.

The dismantling of the Indian Empire, which deprived Pakistan of its role as a granary, was the reason for the decision in the 1950s to opt for a strategy of accelerated industrialisation which was largely outward-oriented but was also diversified. The 1960s appeared to promise success - industrialisation was going ahead with the help of substantial external resources, agriculture was beginning to modernise and growth was rapid (an annual average of 7% for the decade). Today, however, far-reaching imbalances compromise the long-term outlook :

- owing to highly capital-intensive investment, there is an increasingly worrying lack of job creation in industry given the rapid growth of the labour force;

- domestic demand is stagnating as a result of the type of industrialisation chosen, external dependence is increasing, and so is inefficiency because of excessive protection.

- agriculture is neglected, even though the country's agricultural potential is considerable.

To sum up, this is a form of development which has produced perceptible results, but which remains heavily dependent on external impetus. In the long term it is likely to be constrained because the basic requirements of the majority of the population are not adequately taken into account.

... Bangladesh.

The future of Bangladesh promises to be even more difficult. The present situation is more critical than that of the other South Asian countries but it is not possible to detect the beginnings of a satisfactory strategy. Even at its present level (80 million inhabitants), population density is extremely high (500 people per square km), but this population will have almost doubled by the year 2000. The per capita income level is one of the lowest in the world ($110), and even with fairly rapid growth it will probably not have reached $200 by the year 2000; 80% of the population live in absolute poverty, and this proportion can only be reduced very slowly. Faced with this extreme poverty :

- the political authorities, which do not have sufficient roots in the rural world (94% of the population), are unable to mobilise domestic resources around a few priority targets;

- industrialisation is hampered by difficult structural obstacles (the decline of the jute industry), while there are no guidelines for investment - which is mostly foreign;

- external resources at present finance three-quarters of investment and, whatever assumption is made, national savings will only very slowly be able to replace external flows. Above all, however, it is growing more and more obvious that foreign finance is quite unable to solve the country's basic problems;

- lastly, although absolutely necessary, food aid in fact only benefits a minority and is distributed in a manner which discourages national production; food aid requirements have nevertheless decreased in the last few years.

The experience of Bangladesh thus shows very clearly the political nature of long-term development problems, and the inadequacy for such a country of solutions based on traditional strategies of openness to foreign capital. Consequently, it is because no more fundamental solution is in sight as regards internal social structures that the present situation seems destined to last for a long time, with alternate recurrence of famines and better years and, perhaps, growing political instability.

South Asia represents a specific challenge for North-South relations as a whole.

Because of the huge relative size of its population and the immensity of its requirements, South Asia therefore represents a very specific challenge for the whole of North-South relations, probably until well beyond the end of the century. The essential difficulty is how to ensure that the resource transfers which seem humanly necessary are effective in a context in which domestic factors predominate.

Regional prospects : East and South-East Asia

East and South-East Asia will have a combined population of 600 million by the end of the century. Overall, the region is experiencing very rapid growth of industrial output and exports of manufactures. But this is a heterogeneous region, as can be seen from the cases of ....

This is a heterogeneous region which encompasses three groups of countries :

- Four countries which are at an advanced state of industrialisation and are exporters of manufactured goods: South Korea, Taiwan, and the two city States of Hong Kong and Singapore. Their combined population is 60 million with an average per capita income of $950 ($2,700 in Singapore and $2,110 in Hong Kong).

- Four other countries which are mainly agricultural and are exporters of raw materials, but in which the industrialisation process is beginning: Indonesia, the Philippines, Thailand and Malaysia. Their combined population is 234 million, with an average per capita income of $330. Of this group, Indonesia has the biggest population and is the poorest, but it also has the biggest reserves of various natural resources.

- Four socialist countries which are themselves extremely dissimilar: Vietnam, North Korea, Laos and Kampuchea (Cambodia), with a combined population of 75 million inhabitants.

In all, 368 million inhabitants in 1976 and about 640 million by the year 2000.

East and South-East Asia have recently achieved the most rapid growth in industrial production of all the developing countries: 12.3% per year on average between 1965 and 1973, compared with 6.9% in the market-economy developing countries as a whole, and 4.9% in the non-socialist industrialised countries. Still more remarkable is the proportion of this industrial production which is exported: 30% against 10% for the market-economy developing countries collectively and 12% for the world economy. Almost half of all Third World exports in 1975 came from the four industrialised countries in this area: Hong Kong (16.8%), Taiwan (13%), South Korea (12.5%) and Singapore(6.5%).

The examples of South Korea and Indonesia provide a clear illustration of the diversity of the problems confronting this region.

.... South Korea...

South Korea (36 million inhabitants in 1976 and 53 million in the year 2000) achieved absolutely unprecedented growth rates between 1962 and 1976: 10% per year on average for national product, 18% per year for industrial production, and 35% per year for exports (mainly manufactures). Income distribution ($670 per capita in 1976) has made considerable progress towards greater equality, thus contributing to the gradual expansion of the domestic market.

The reasons for these successes include :

- skilled labour and low wage levels;
- an active government strategy of export promotion (various domestic stimuli, efforts to penetrate new foreign markets);
- up until 1973 at least, growing demand in the industrialised countries;
- lastly, an international political context which has produced a considerable influx of external resources on very soft terms.

The conjunction of these various conditions, which is specific to East-Asia, has resulted in a competitive and already very diversified industrial base. The main challenge during the next two decades will be to continue to expand without causing any protectionist backlash. The outcome will therefore depend on continued export diversificaton and increasing satisfaction of domestic requirements by national industries. Korea's chances in this respect are uncertain: the official forecasts are very optimistic and project an economy based on an industrial system with more and more ramifications and which is very open to the outside world. Growth of the sort anticipated by Korea's planners would raise the level of per capita income to above $4,000 by the year 2000, i.e. to above the United Kingdom level in 1976. Even if this is an optimistic figure, there can be little doubt that the country will be part of the developed world by the end of the century, but at all events, the continuation of rapid growth will doubtless necessitate a progressive adaptation of political structures.

... Indonesia ..

Indonesia's development problems are completely different in nature. For the moment they do not appear to be in the process of being solved. An already large population is growing rapidly (135 million in 1976) and almost 200 million by the year 2000) and is unevenly distributed, two-thirds of the inhabitants living on 7 per cent of the land; in the central islands (Java, Madura, Bali), the density is greater than 600 people per km^2. Poverty is acute, with a per capita income of $240 in 1976 and, above all, 85 million inhabitants (63 per cent) living in absolute poverty.

Its economic potential is nevertheless considerable, since it has both agricultural resources (rubber, wood, rice) and minerals (petroleum, tin). However, Indonesia has not yet succeeded in harnessing this potential for the purposes of sustained development. The Soekarno regime, which ended with the coup d'Etat and repression of 1965-66, had paid only secondary attention to domestic economic problems. Consequently, overall production grew at an annual rate of only 3.2 per cent from 1950 to 1965. For the past 10 years, Indonesia has had an "open door" policy with regard to foreign investment in the hope of promoting more rapid industrialisation and growth. This acceleration has in fact been achieved (annual GDP growth of 6.9% on average from 1965 to 1973), but in a manner that empirically does not appear to have contributed greatly to satisfying domestic requirements which are becoming more and more pressing :

. Manufacturing industry turned towards import substitution, but very soon came up against the limitations of the domestic market. This is paradoxical in a country with a population of 135 million, but the type of industrialisation adopted - based on foreign capital and highly capital-intensive - resulted in a low level of value added which restricts the expansion of both domestic income and the market.

. The export industry, centred on the processing of agricultural and mining raw materials, has created few jobs. What is more, there has never been a systematic policy for utilising the petroleum reserves that are capable of triggering off a self-sustaining growth and development process. Nobody now would dream of denying the enormous wastage caused by the way Indonesia has exploited its oil resources, given the chaotic investment structure it has induced, the gross mismanagement which has resulted, and the scant chances which remain, in view of the country's resources, of using the last years of abundant oil supplies (1) for the purposes of long-term development.

In all, Indonesia is an example of a country where there is the risk that poverty problems may persist despite considerable natural resources and fairly rapid growth, unless the development strategy pursued permits resource utilisation, and results in better income distribution. Indonesia is a perfect example of a developing country whose future will depend on the strategies it adopts.

The interdependence of internal and external factors is of great importance for the region's long-term development prospects.

Despite the obvious heterogeneity of the region, as illustrated by the above examples, the interdependence of internal and external factors is of particular importance for the long-term development prospects. Between the extreme cases of Kampuchea (ex-Cambodia), which has completely withdrawn from the outside world, and the city-states which subsist only because of the functions they fulfil in international economic relations, the criterion of differentiation for the countries of this part of the world is the extent to which they are open to the outside world, much more than political and ideological alignments. However, above all it is the domestic responses of these countries to this openness which will be important for the future: ill-adapted in the present Indonesian situation, dynamic in the case of South Korea and uncertain in that of Vietnam. The case of ASEAN, which groups five of the region's major countries (Indonesia, the Philippines, Malaysia, Thailand and Singapore), and which it is still too early to assess, will be of particular importance in that it will show to what extent such an association is the result of a purely external initiative, is a defensive reflex or, on the contrary, stems from a positive desire for cooperation between the countries concerned.

External influences will in any event remain considerable in the region, but they will undergo profound changes over the next 25 years: the growing economic influence of Japan throughout South East Asia; the gradual opening up of China vis-à-vis Japan and also other countries in the region; the possible development of quarrels over hegemony among the chief powers of the continent. In particular it is because each country's ability to respond to these influences would appear to be very different that the disparities between them as regards development are bound to become more pronounced in the course of the next two decades.

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(1) At the 1975 rate of extraction, it is estimated that reserves will probably be exhausted by about 2005.

All in all, some of the countries in this region (South Korea, Taiwan, Hong Kong, Singapore, Malaysia and perhaps the Philippines) will probably lose their remaining features of underdevelopment before the end of the century, whereas there is the risk that others, like Indonesia, will continue to belong to the poor part of the Third World in the absence of new strategies.

Regional prospects : Latin America

Latin America (560 million inhabitants by the end of the century) has features of both the industrial and the developing countries. Per capita income there might amount to between $2,600 and $3,200 (1976 prices) at the end of the century.

In many respects, Latin America seems closer to the advanced industrial countries than to the developing world: the importance of external inputs in its population and culture; the accession of its nations to sovereignty more than a century ahead of the rest of the Third World; a much higher level of per capita income than in other regions ($1,095 on average in 1976, compared with $150 in South Asia, $280 in Sub-Saharan Africa and $450 in East and South-East Asia); prospects for an acceleration in growth which should bring that income up to between $2,600 and $3,200 by 2000, i.e. to approximately the same level as in Italy today; lastly, the relatively advanced level of industrial diversification (the share of consumer goods in manufacturing production fell from 65 to 42% between 1950 and 1970).

However, some of the essential features of the region make it unequivocally part of the Third World:

Brazil, Mexico and Argentina are the three leading producers of the Third World. Their long-term development prospects and their types of industrialisation will depend both on internal strategies and on world relations.

(a) The demographic transition is by no means complete and the rate of growth of the population is still very high (2.7% per year for the population as a whole and 3.0% for the labour force); the total population can thus be expected to increase from 309 million in 1976 to about 560 million by the end of the century.

(b) The social structure, which is profoundly and traditionally inegalitarian, has had a predominant impact on the type of industrialisation and modernisation :

. the halting of agricultural reforms, with the result that the rural world and food production have made limited progress;

. the persistence and even worsening of income inequalities (1), so that industrial growth has depended on increased consumption by the rich or on increased exports.

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(1) For example, between 1960 and 1970 the share of total income received by the 5% with the highest incomes increased from 23 to 27% in Brazil, and from 29 to 36% in Mexico.

(c) Per capita income in Latin America has grown less rapidly over the past 25 years (2.6% per year) than in the developing world as a whole (3.0%), and there is still acute poverty in many areas. One can thus say that there was a sort of false start to the economic development of the continent.

(d) The conditions under which the Latin American economies are being gradually integrated in the world economy do not encourage domestic development. Raw materials still account for the bulk of exports (1). Industrialisation was directed initially towards import substitution, but this involved considerable protectionism which for a long time retarded the growth of a competitive industry. When industrialisation became export-oriented, the conditions in which this took place limited Latin America's control over its industrial development. In the last ten years or so, multinational companies have taken over from domestic entrepreneurs in providing the impetus needed by industry. But above all, the bias towards export promotion has not prevented the structural balance of payments deficit from worsening, whence the problem of indebtedness which is not only at a very high level but is increasing much more rapidly than economic growth. It is primarily in this sense that it is possible to speak of Latin America's continuing economic dependence, despite its obviously increased economic capacity as a result of industrial diversification and improved access to international capital.

(e) Lastly, the political structures of most of the countries in the region are closely bound up with the Latin American characteristics of this type of growth: internal authoritarianism is combined in most cases with a risk of chaotic instability and relations of political dependence. The importance of the economic role played by the State accentuates the consequences of such structures.

The development prospects of four countries exemplify certain general characteristics:

Some two-thirds of the population and production of Latin America are concentrated in three countries - Brazil, Mexico and Argentina - which are amongst the five biggest industrial producers in the Third World (almost 42% of the developing world's total industrial production in 1973). For these countries especially, long-term development prospects and forms of industrialisation will not depend on domestic strategies alone, but also on trends in world relations: while they could become the industrial suppliers of the Third World in an (improbable) confrontation scenario (scenario C), they would have to increase their degree of specialisation and make their industrial structures more competitive in the integration scenarios (scenarios A and B); in the protectionist scenario (scenario D) they would give priority to satisfying domestic demand.

... Brazil ...

Brazil had a population of 110 million in 1976, i.e. more than one-third of the population of Latin America, and this may have increased to 213 million by the year 2000. Per capita income was $1,140 in 1976 (it could be close to $3,500 by the end of the century), but this average conceals very big disparities between social groups and regions, particularly between the industrialised South and the arid North-East (2).

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(1) 97% in 1955, 82% in 1973 (including food products).

(2) In 1970, the Gini co-efficient was put at 0.57; the poorest 20% of the population received 5% of total income.

Economic growth has been remarkably rapid during the last 25 years as a whole and it accelerated still more at the beginning of the 1960s; per capita income rose by 3.7% on average from 1950 to 1975, but by 6.8% from 1970 to 1975. After being a commodity exporter initially, Brazil is now the leading industrial producer in the Third World (1.4% of world production, and 18.4% of the production of the developing countries, excluding China). Like most other Latin American countries, to begin with it concentrated mainly on the import substitution industry, so that the stimulus to growth depended on demand by the richest sections of the population. The relatively tight limitations of the domestic market thus conceived then prompted the public authorities to direct more attention towards foreign markets. Over the last ten years, exports have risen considerably as a result of very extensive support from multinational companies. This orientation restricted growth of the domestic market still more because of the relatively capital-intensive structure of investment in the export industries, which, all other things being equal, checks the growth of both employment and the volume of wages distributed (1). In this context dominated by the multinationals, the capacity to invest remains closely bound up with the capacity to import. Growth prospects and, more generally, long-term development prospects remain favourable. They will be very much dependent on trends in the socio-political structure, power relationships and the various types of alliances between the components of this structure. From the economic standpoint, different balances may emerge between State enterprises, private Brazilian enterprises and the multinationals. Similarly, the level of protectionism and the respective roles of exports and the domestic market will also be affected by such trends.

... Mexico ...

Mexico provides another example of the difficulties of a development process of the conventional type when it has to contend with a social structure with large disparities between social groups (in 1970 the poorest 40% of the population were left with only some 10% of total income, compared with 13% in 1950), and with a situation of close dependence on a much more powerful neighbour. Two-thirds of Mexico's foreign trade is with the United States and there is also considerable migration to the United States. The situation is made worse by an exceptional factor: population growth is extremely rapid (3.5% per year on average), despite an income level of almost $1,100. This is why the remarkable growth of total production (in the region of 6% per year for the last three decades) has been rather slow to affect the living conditions of the majority of the population. Although the birth rate is gradually slowing, the population (62 million in 1976) will have more than doubled by the end of the century.

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(1) In 1976, industry accounted for 24% of GDP and only 18% of the labour force. In the United States, the corresponding percentages are 25 and 33%, and in the industrialised countries as a whole, 29 and 39%. Even allowing for the possibility that these comparisons incorporate many inaccuracies and the fact that they also reflect labour-intensiveness in agriculture, the size of the differences is still significant.

In these circumstances, employment prospects are particularly worrying. Agriculture is stagnating, and rural proverty is becoming increasingly acute. Industrialisation is relatively advanced, Mexico being the third largest industrial producer in the Third World (11.2% of Third World production in 1973 - excluding China - and 0.8% of world production). However, the characteristics of the mode of industrialisation are comparable with those of Brazil: a domestic market confined to the highest income brackets, excessive protection leading to inefficiency, control over growth exerted by the multinationals and, above all, investment which generates few jobs (1). Oil production, which is expanding rapidly, will of course bring in appreciable additional resources, but will not suffice to solve these structural problems, and may create others.

Consequently there is no doubt that political choice will determine the long-term direction of development, particularly with regard to opening the economy to the outside world and a less inegalitarian distribution of income.

... Argentina ...

Present conditions preclude an assessment of the long-term prospects of the third major country, Argentina (26 million inhabitants in 1976 and 33 million in 2000). Per capita income is at present the highest in the region after Venezuela ($1,550 in 1976), but this has been growing slowly for the past 25 years (1.9% per year on average). Population growth is also slow (1.5% on average from 1950 to 1975, and only 0.8% now). Argentina is the fourth biggest industrial producer in the Third World (1.1% of world manufacturing production, excluding China) and of the Third World countries it appears to be one of the closest to the industrialised world. However, the already long-standing break in its dynamism and the social, economic and political conditions now prevailing give reason to fear a probable weakening in the relative position of this country which, at least at present, provides the clearest example on the continent of a early economic start, followed by the obstruction of social and economic development.

... Venezuela .

Venezuela has a population of 12 million which will have doubled by the year 2000. Because of its oil resources, per capita income is the highest in the region ($2,570 in 1976). Two characteristics stand out :

(a) The contrast between an exceptionally democratic political regime (in the context of the continent) and inegalitarian income distribution.

(b) The impact of oil production on the type of development. This influence is not new; up until 1970, Venezuela had been the world's leading oil exporter for more than four decades. At present, 90% of its export earnings come from oil, but at the 1975 rate of extraction its reserves could be exhausted in 20 years. Abundant oil revenues have paid for imports which have prevented the development of other sectors of national activity; Venezuela has allowed its agriculture to waste away (45% of the labour force in 1951 and 18% in 1977) and the agricultural deficit is growing. Similarly, education has traditionally been neglected, and there has been a "brain drain" from neighbouring countries.

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(1) Industry accounted for 25.8% of GDP in 1976 and employed 23% of the labour force (see the figures for Brazil, the United States and the industrialised countries in the preceding footnote).

Venezuela's long-term future will therefore depend on its ability to :

- redistribute the profits from oil revenues in a less inegalitarian manner;
- correct the excessive sectoral imbalances in its economy (in particular by expanding iron ore extraction and processing, and through agricultural development).

By the end of the century Latin America will probably have increased its lead over most of the other major regions of the Third World.

All in all, Latin America will probably increase its lead over most of the other major regions of the Third World. INTERFUTURES scenario A predicts, for example, that per capita income in Latin America will be in the region of $2,300 (at 1970 prices) by the year 2000, compared with $210 in Asia and $380 in Sub-Saharan Africa. If this growth is to result in real development, however, two major challenges will have to be met :

- The first concerns its internal political and social equilibrium, where extreme inequality is a source of possible outbursts which will not always be contained by increased authoritarianism;

- The second concerns its control over economic growth by increasing the efficiency of its production system and expanding its domestic markets more. Building up domestic industry and integrating the activities of multinational corporations more closely with economic and social development programmes are especially necessary in that prospects for regional cooperation - which are favourable in the very long-term because of the many complementary features of the Latin American economies - still have to contend with serious economic and political obstacles.

In any event, and unlike, for example, South Asia, the future of the continent will depend both on its internal choices and on the strategies adopted by the industrialised countries.

Regional prospects : North Africa and the Middle East

This region, with a population of about 330 million by the year 2000, has 87% of OPEC reserves,

The Arab world had a population of 124 million in 1976 (1), of which 39 in the Maghreb, 38 in Egypt and 44 in the Middle East. Including Iran, the total population of the region was 159 million; this will probably be in the region of 330 million by the year 2000.

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(1) This figure does not include the Sudan, Mauritania and Somalis, which may be considered to be an integral part of the Arab world, but in this report are included in Sub-Saharan Africa.

but despite a degree of cultural and religious homogeneity, it is characterised by wide economic diversity and great political instability.

The region's economic prospects will obviously be dominated by oil resources and the use made of them, since it has 87% of the OPEC countries' reserves. However, the extremely unequal distribution of resources and populations between the States as at present defined demands that very clear distinctions be made between the various problems of the future. Thus, the national incomes of the oil-exporting Arab countries are in aggregate equal to three-quarters of that of the entire Arab world, but they have only one-third of its population.

But the size of its oil reserves will give it considerable power for the next two decades at least.

The countries exporting no (or little) oil had an average per capita income of $455 in 1976, and this average itself conceals a fairly marked disparity between poor countries such as the two Yemens ($250 and $280), and above all Egypt ($280), and more advanced countries such as Morocco ($540), Tunisia ($840), Syria ($780), or the Lebanon ($1,070 in 1975).

The cases of three countries are briefly discussed :

In contrast, the average per capita income of the oil-exporting countries is six times that of the other countries ($2,810 in 1976, and $1,930 in Iran), but this income can hardly be looked upon as a satisfactory way of measuring development, since the social indicators (literacy, infant mortality, life expectancy) are well below those usually associated with this level of income. In addition, the breakdown of oil reserves between these countries is itself very unequal, and reveals two quite distinct groups of countries which differ according to the relationship between their reserves and the population:

Table 36

Oil reserves in North Africa and the Middle East, 1975

	Reserves at 1.2.1975 (billion barrels) (a)	1975 production (billion barrels) (b)	Duration of reserves at 1975 rate of production (no.of years) ($c= \frac{a}{b}$)	Per capita reserves in 1975 (barrels) (d)
Saudi Arabia	152.1	2.59	59	18,300
Kuwait	71.3	0.77	93	70,900
United Arab Emirates	32.2	0.62	52	49,300
Qatar	5.9	0.15	40	29,500
Libya	26.1	0.55	48	10,700
Total	287.6	4.68	61	22,700
Iraq	34.3	0.84	41	3,100
Iran	64.5	1.97	33	1,900
Algeria	7.4	0.37	20	470
Total	106.2	3.18	33	1,760

Sources : Energy: Global prospects 1985-2000, Report of the Workshop on Alternative Energy Strategies (Caroll L. Wilson, Project Director), McGraw Hill, 1977 World Bank Atlas, 1977.

- The first group has abundant reserves in relation to population (22,700 barrels per inhabitant on average) and the average duration of their reserves is in excess of 60 years; This group has considerable surplus income in relation to its internal absorptive capacity, and is therefore faced with the problem of allocating and managing its financial assets, which it largely entrusts to the Western banking system.

- In the second group, the reserves/population ratio is much lower (less than 1,800 barrels per inhabitant on average) and the average duration of the reserves is of the order of three decades only; the main challenge that these countries face is to use this limited period of time to ensure that the conditions exist for self-sustaining growth and development in the long-term. Algeria and Iran are the best examples of this group.

In any event, the size of the region's oil reserves will give it considerable power for at least the next two decades vis-à-vis the advanced industrial countries as well as the Third World countries which do not have such energy resources.

If, finally, one looks beyond the distinctions arising out of existing frontiers, one finds a region with abundant and remarkably diversified resources. The Arab world also has an exceptional cultural homogeneity, reinforced by political awareness of an "Arab nation" that has no counterpart in any other region of the Third World. Therefore, if the prospects for regional cooperation were to materialise, they would constitute an essential element in the area's future development. But there are serious political and social obstacles to such cooperation, especially as the region is currently one of the most politically unstable in the world - and there is no knowing how long this state of affairs may last.

... Egypt ...

Egypt. The population is by far the largest in the Arab world (more than one Arab in four is Egyptian); population growth is rapid (38 million in 1976 and 59 million by the end of the century); and it has the biggest city in Africa (Cairo, with 8 million inhabitants). There is fertile land, but it only accounts for 3% of the national territory, and agricultural imbalances have turned Egypt into a net food importer. Egypt produces only a small quanity of oil, but industrial output is the highest in the whole area (as well as in Africa). Per capita income is low ($280 in 1976), is growing slowly (an average of only 1.4% per year for the past twenty-five years) and is heavily handicapped by military expenditure. Egypt receives a bigger overall volume of aid than any other country except India (in 1976 $1.8 billion including $1 billion in bilateral aid from OPEC) (1); indebtedness was in excess of $5 billion at the ned of 1976. That, summed up in a few figures, is Egypt's situation.

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(1) In 1975, Egypt received $2.4 billion, of which $2 billion was bilateral aid from OPEC, i.e. more than India ($1.7 billion). The contrast is even more striking if one calculates the amount of aid received per inhabitant: $65 in 1975 and $47 in 1976 in Egypt, compared with less than $3 in India.

There have been two successive development strategies:

- under Nasser, the strategy was a nationalist one focussing on industrialisation without external dependence, and this resulted in fairly rapid growth (according to the estimates, between 5.2% and 6.7% per year on average during the decade prior to the October war) and a more egalitarian distribution of income;

- since 1974, Egypt has been more open to foreign investment and to the private sector, but has not had an overall strategy for industrial and social development.

Present uncertainty is admittedly due, at least in part, to current circumstances; it was difficult to implement a real development strategy as long as the military situation remained. In the longer term, the seriousness of the problem posed by the scarcity of land and the growth of the population, leading in turn to increased poverty, will constitute a compelling need for clearer options in favour of one of the major types of strategy that can be envisaged:

- a strategy of a conventional type, aimed at integration in the world economy, which would do nothing to alleviate the poverty of the majority of Egyptions;

- a reformist strategy aimed at growth and more equitable income distribution;

- a radical strategy giving priority to the satisfaction of basic needs; those who support this option appear to link it with at least a partial withdrawal from relations with the industrialised countries.

... Algeria ...

Unlike Egypt and many other Third World countries, Algeria is notable for the consistency of its development strategy. The "Algerian gamble" consists of using the revenue from its hydrocarbons (oil and natural gas) to finance integrated industrialisation - i.e. producing both consumer and capital goods - planned and implemented by State companies.

This industrialisation :

- implies thorough integration in the world market where Algeria sells its hydrocarbons and procures the production inputs it lacks;

- is part of a long-range strategy, which means that it is possible consciously to accept the eventuality of pronounced "excess costs" (because its choices are restricted by the external situation, or as a result of initial management errors).

In this context, the importance of links with the industrialised countries is obvious. However, the real significance of this experiment with interdependence will depend, in the final analysis, on Algeria's ability to diversify its industrial exports and on the experiment's success at home with respect to the development targets announced. It is calculated that the population (16 million in 1976) and per capita income ($990 in 1976) will have more than doubled by the end of the century. However, the difficulties of achieving a socio-political balance (in particular between the new State bourgeoisie and the rural population), the dangers of the model being warped by the privileged social classes of the bureaucracy, trends in agriculture and, lastly the terms of trade with developed-country enterprises, will constitute critical elements in the long-term future of this experiment.

... Iran ....

With 34 million inhabitants in 1976 (and probably 60 million by the year 2000), Iran offers a startling illustration of the uncertainties of those oil-based economies which have not yet succeeded in laying sound foundations on which to establish their "post-oil" development. It is still too early to gauge the full implications of the violent change of régime at the beginning of 1979; clearly, however, it has radically altered the country's long-term development prospects. The strategy pursued up until 1978 had the benefit of a number of assets:

- Iran's oil production was considerable (second in the Middle East after Saudi Arabia, and approximately 10% of world production in 1975), with abundant reserves of oil and natural gas. On a per capita basis, however, its oil reserves are almost ten times smaller than those of Saudi Arabia; if the 1975 rate of extractions were resumed, they would probably be exhausted in a little over 30 years.

- Its economic growth was vigorous well before the 1973-74 oil boom; the average rate of growth had been 11% per year since the beginning of the 1960s, and had been accompanied by a remarkable growth in employment and by the development of an increasingly broad middle class. In terms of absorptive capacity, the foundations for future growth would therefore seem to be more solid in Iran than in competing Arab countries.

- Lastly, its external relations were remarkably diversified (from the financial, trade and political standpoints), Iran taking advantage of a privileged geographical position between the West, the Arab world, the socialist countries and South Asia.

But the imbalances created by this situation had become more and more pronounced, namely:

- the predominance in this strategy of power objectives, and the development of inordinately strong armed forces;

- the sectoral imbalances in the economy caused by the abundant supplies of oil: insufficient agricultural growth, particularly as regards food; the development of speculative activities; very rapid industrialisation but much more capital-intensive than in the past;

- but, above all, social and cultural imbalances. These are what brought about the collapse of the régime and its strategy. But the long-term problems are still there, in particular that of finding a balance between the rate of growth, the increased ambitions of the groups that have benefited from progress, pressure from the unemployed, the rural population and the national minorities, the hostility of the conservative sections of the population opposed to growth and, of course, the power of arbitration which may be imposed on these different tendencies. The components of a new dynamic equilibrium can only emerge very slowly, especially since the choices involved concern the most fundamental elements of society's organisation and the process of modernisation.

Increased regional cooperation would have a number of factors in its favour, but would encounter numerous internal and external obstacles.

No other region in the Third World combines so many decisive factors arguing in favour of increased regional cooperation :

- an influx of capital resources on a scale that will probably never be equalled elsewhere;
- great cultural homogeneity in the Arab world;
- inequality, but also remarkable complementarity in the distribution of resources between countries (the most obvious example of this complementarity being Saudi Arabia's oil and financial resources, Egypt's human resources and the Sudan's agricultural resources); the resulting migration and capital flows have already assumed significant proportions.

Yet, this cooperation is progressing very slowly; it is non-existent between the Maghreb countries and marginal in the Middle East. Despite the increased number of formal institutions for inter-Arab cooperation, the region is still very far from representing a real market, there is as yet very little co-ordination of investment projects and the brain and skills "drain" is reaching alarming proportions. The reasons for this situation include:

- first, the need to solve the Palestinian problem;
- the rivalries between political régimes and development models based on widely differing ideologies;
- lastly, the importance of the oil issue for the industrialised countries, which gives a critical significance to external pressures and the type of international relations that they produce. These are undergoing profound changes; the region is gradually freeing itself from a colonial-type situation and is exercising greater control over its own resources (via the operating systems, prices and staffing); interdependence with the industrialised countries is gradually taking the place of unilateral dependence. In the long-term, this trend is very probably irreversible. However, as long as there is no substantive political agreement on the forms of regional cooperation - which probably requires the emergence of an arbiter inside the region - the development process will continue to be dominated by outward-looking elements.

Interdependence between the region and the developed countries as a whole is particularly strong.

Long-term analysis reveals three facts which are important for preparing the strategies of the developed countries :

- Oil is in the process of disrupting the social structures of these countries, hence a constant risk of instability.
- The transition from the oil to the post-oil age may generate explosive situations in some countries, and the developed countries could perhaps help the governments of the countries concerned

to implement policies to reduce this risk.

- In no other Third World area is development so sensitive to the rate of growth of the developed countries as a whole.

Regional prospects : Sub-Saharan Africa

Together with South Asia, Sub-Saharan Africa (probably 550 million inhabitants by the year 2000) is the Third World area which will present the most acute poverty problems over the next two decades.

Together with South Asia, Sub-Saharan Africa is the Third World area which today presents, and will continue to present over the next two decades, the most acute problems of poverty. The probable acceleration in population growth, the weakness of its economic and political structures and the absence of any counterweight to foreign influence are the main obstacles to long-term development.

Sub-Saharan Africa had an overall population of 345 million in 1976, split up between 48 different countries. The rate of growth of this population is already high (2.7% per year), but is going to accelerate owing to the fact that mortality (at present still very high - over 2%) is decreasing much more rapidly than fertility. Under the circumstances, the population will probably reach 550 million by the year 2000 (including South Africa).

Per capita income was only $200 in 1976 (excluding South Africa). Moreover, this average is distorted by the presence of pockets of modern activity barely integrated into the national economies - particularly in countries with above-average per capita incomes. The vast majority of the population is therefore probably living well below this average level, although the size of the subsistence economy makes the significance of such figures relative. Since 1960, this per capita income has grown much more slowly than in the Third World as a whole (Table 37). At the end of the century per capita income will probably still be under $400 at 1976 prices.

Table 37

Per capita income growth in Sub-Saharan Africa

Rate of growth of per capita income	1961-65	1966-73	1974-77
Sub-Saharan Africa	1.3	1.9	2.1
All developing countries (excluding China)	3.4	4.1	3.1

Source: World Bank Annual Report, 1978.

Many of the African countries are characterised by plentiful natural resources, a large primary sector and activity which is markedly outward-oriented.

Their future will depend on the trend of political and social structures, the development of agriculture and the forms of industrialisation chosen.

In most African economies :

(i) natural resources (agricultural, energy and above all mineral) are relatively abundant and still largely untapped; they are very unevenly distributed, with South Africa being by far the best endowed country;

(ii) economic activity is dominated by the primary sector (agriculture and mining) and, to a lesser degree, by a relatively overgrown tertiary sector; the level of industrialisation is still low (the manufacturing sector accounted for only some 11% of production in 1973);

(iii) apart from the subsistence economy, economic activity is therefore largely outward-oriented and dependent on other countries:

- foreign trade accounts for approximately 27% of national product (but manufactured goods make up only 5% of exports);
- capital, technological and managerial resources are still largely of foreign origin; per capita aid receipts are higher than in any other region : $10 per person in 1976.

The impact of colonisation remains more enduring in Sub-Saharan Africa than anywhere else, not only as regards the economic production and consumption structures, but also, and much more deeply, as regards the political and social structures and the cultural domination phenomena underlying these structures. The extreme political fragmentation of the continent, in particular, where in many cases the only justification for frontiers was a colonial agreement, makes it difficult for a number of the present States to be viable, at least inasmuch as they are pursuing - as most of them claim - a conventional type of development strategy based on industrialisation and the imitation of Western modernisation. Colonisation achieved a certain form of coherence; this has disappeared, leaving a number of disjointed elements and political structures which are too new and as yet too weak to compel any new coherence. In this context, ethnic factors are regaining considerable influence but can hardly be said to be facilitating integration of the new nation-states. All in all, however, the flexibility of the socio-political structures is still greater than in many other Third World regions and might thus permit more rapid development. As for the continent's resources, they continue to exert their attraction; but the type of development to which they lead benefits only a small minority living off these external relations, while the vast majority is only marginally concerned.

Agriculture (41% of production in the low-income countries and 28% in the middle-income countries in 1976; approximately 40% of the labour force) is essentially a dualistic agriculture in that it comprises two sectors whose orientation and dynamism are very different: a traditional sector composed of small farms which provide the bulk of subsistence food production, and in which women more often than not play a significant role; and a modern sector where the farms are often larger, the techniques more elaborate and productivity much greater, producing cash crops for the domestic market and, above all, for export. These two sectors, which are not always very clearly separated, compete with each other for the allocation of productive resources - not so much land itself (apart from localised exceptions) as investment, related services (research, extension) and infrastructures (which remain export-oriented after the colonial pattern). The privileged position of the modern sector is the outcome of a twofold power relationship: between the urban and rural sections of the population on the one hand (which generates unfavourable terms of trade for small farmers), and between export and domestic demand on the other.

In the long term, there will be no development in Africa without a profound change in this situation; productivity must increase throughout agriculture (not just in the sector which has now been modernised), and also in other rural activities, in order to :

- raise the standard of living of a population which is still very largely rural, and for which migration to the towns is unlikely to provide a solution;

- ensure Africa's food self-sufficiency: per capita food production has fallen constantly since the beginning of the 1960s (1) and the probable cereal shortfall for 1990 is put at 24 million tonnes, of which approximately two-thirds for Nigeria alone.

The industrialisation of Sub-Saharan Africa has not advanced very far. For the most part it is managed by non-Africans, and is restricted to primary processing of commodities, mainly minerals, and light import-substituting industries. In 1973, the eight most industrialised countries of Sub-Saharan Africa (excluding the Republic of South Africa)(2) together accounted for only 3.3% of production by the developing countries and 0.25% of world production. Industry in these countries is given a high degree of protection (in proportion, it would seem, to the powers of the foreign or national groups which request it, rather than in accordance with any precise development strategy), and employs only a small proportion of the labour force (in the region of 11%). It is relatively inefficient, having to contend with a scarcity of skilled labour and managerial staff, and also with pay structures which bear no relation to productivity.

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(1) According to FAO, the index for this production, on the base 1961-1965 = 100, was 99 on average during the years 1966-1970, and 96 during the years 1971-1976. In all the other Third World regions, this index is rising (see World Bank, World Development Report, 1978).

(2) Nigeria (1970 $754 million), Rhodesia (468), Ghana (320), Zaire (280), Kenya (271), Zambia (259), Ivory Coast (225) and the Sudan (205).

Between now and the end of the century, the direction industrialisation takes will continue to depend largely on foreign initiatives. Consequently, it will probably be concentrated in countries with abundant natural, mineral, agricultural and energy resources and which offer, irrespective of their political orientation, an "investment climate" considered satisfactory by foreign countries. The two main avenues of industrial expansion will continue to be mineral processing and light manufacturing. In the case of the latter, prospects for the development of the domestic market are still very limited because of political balkanisation, the level of monetary incomes and transport costs. Exports of manufactures will continue to depend on foreign, and particularly European, initiatives, but the comparative advantages are far from decisive. In the longer term, it is obviously not impossible that industrial activity may be redirected towards meeting social needs, but this implies improved infrastructures and, for many countries, a change in national and international political structures that seems unlikely in the immediate future. The most probable trend is only moderate development of manufacturing industry, even in the now more advanced countries like Ivory Coast, Ghana and Nigeria (where the impact of oil production on overall economic development does not seem to have been really positive so far). Particularly in Central Africa, the processing of mining products can have a far-reaching effect, provided that investment recovers its buoyancy (which obviously implies a reduction in political risks), and that the African countries themselves are more successful in using the benefits of this activity for long-term internal development.

In this context, three types of evolution are possible:

Three types of evolution are conceivable: increased foreign impetus in economic growth, "self-centred" development, or a continuation of the present situation.

(1) Increased foreign impetus given to economic growth, with the continent's resources being exploited more intensively by the world economy, and Africa more fully integrated in this world economy as a result. This trend would bring with it increased industrialisation and exports, and also aid in order to prevent excessive imbalances in the poorest countries. It would permit more rapid growth, but in the absence of complementary measures it could well benefit only a minority in the continent, while remaining entirely dependent on outside initiatives.

(2) "Self-centred" development, giving priority to domestic requirements over demand by the world economy. Although obviously desirable in principle for the future of Africa itself, this comes up against practical problems of implementation (definition of priorities, mobilisation of resources, organisation of trade) and, above all, the obstacles represented by existing socio-political structures.

(3) Unless, as a result of choosing the first alternative, the conditions required for the second were gradually to be created, one is forced to envisage a third possibility which would result if the first two were blocked; essentially, this would be a continuation of the present situation of virtual economic stagnation, particularly with regard to agriculture, with escalating local conflicts and external interference.

Underlying these three types of evolution is the inescapable fact that Africa must mature politically and so gain more control over its own development.

But there is still a danger that poverty will get considerably worse.

Unless the orientation of its economy changes, there is a danger that poverty will become considerably worse in Africa during the next two decades. The industrialised countries will continue to play an essential role but this internal problem presents them with a delicate choice concerning the nature of their economic and political relations with the continent. If they opt for real development in Africa this should help in particular to :

- foster the growth of commodity exports by contributing to mining investment and also the diversification and stabilisation of export earnings;
- concentrate resource transfers on increasing agricultural productivity and improving infrastructures;
- promote industrial development which is more efficient and better suited to the continent's essential development problems, in particular employment and the adaptation of technologies.

Regional prospects : China

China's influence in the future will depend on its domestic and international policy choices.

Rapid development up until the end of the century cannot be considered a certainty, but there is a good chance that such development will take place.

More than for any other country, the future influence of the People's Republic of China on the world economic system will depend on its domestic and international policy choices :

- A new development period has been officially in progress since the beginning of 1978, the declared aim being to "make China a great and powerful socialist country by the end of the century, with modern systems of agriculture, industry, national defence and scientific and technical research activity". To what extent is the aim likely to be achieved? To attempt to answer this question, it must first be broken down :

. First question : following the death of Mao Tse Tung, will China enter an era of political stability which will enable it to pursue an uninterrupted strategy of economic growth over a long period? Some argue that when the life of a human community has been disrupted by a major revolution and the founding generation then disappears, this community reverts to a greater stability. Others stress the tenuousness of the balance between the ideological or regional groups within the Chinese communist party, and consequently the difficulty of making any long-term prediction. Therefore, even if the answer to this first question is inclined to the affirmative, great caution would still be necessary.

. Second question : assuming that the objectives remain the same, is the Chinese economy capable of achieving a sustained rate of growth? In this connection, when one considers the few short periods in the last 25 years during which political confusion has not disorganised the economy, one cannot fail to be struck by the capacity that the Chinese economy has shown to adjust successfully to changes in resource allocation. The results were particularly impressive when foreign technologies and equipment were called in (from Eastern Europe between 1953 and 1957, and from the Western countries from 1971 to 1973). Nevertheless, even if the answer to this second question is much more decidedly in the affirmative, the Chinese economy's future development will depend on the choices made in two important connections: the development model - will China opt for Soviet-style centralised planning with priority for large-scale industrial projects, or for decentralised State capitalism with manufacturing industry playing a major role? (1); the amount of investment and the distribution of its origin between national saving and foreign borrowing, the frailty of the agricultural equilibrium doubtless limiting the possibility of internal resource transfers to industry.

So, it cannot be considered a certainty that China will experience rapid economic development up until the end of the century, but there is quite a strong chance that it will.

. On the international plane, three assertions have always characterised Chinese policy : the assertion that China is a revolutionary socialist State; that it is a developing country and lastly, that it is a nation with a tradition of contributing to world order which goes back a thousand years. However, its actions with regard to frontier disputes, the continental shelf and the islands in the South China Sea have shown clearly that it is the third assertion which in practice has been given priority. In this case, it may be supposed that the aim of China's foreign policy in future will be to facilitate economic development at home and to strengthen China's position as a great power, notably in Asia.

China's development over the next quarter-century will probably be marked by a gradual slowdown in population growth, the continuance of a tenuous equilibrium in agriculture, and rapid growth of industry and energy production. All told, an aggregate growth rate of about 6% a year does not seem impossible.

Starting with these assumptions, what will the basic features of China's development be over the next 25 years?

. With the reservations necessitated by the great uncertainty about China's population (2), it is first of all to be expected that population growth will gradually slow down, the annual rate of growth being reduced from 1.5 - 1.7% at present to 0.8% at the end of the century. Specialists on China agree that this slowdown is necessary if employment and nutrition problems are to be coped with. This trend would bring the population up to around 1,150 million by the end of the century and would mean an increase in the labour force from 440 to 590 million between 1977 and 2000.

. Next, it is necessary to stress the importance of agricultural development, with priority being given to cereal production over industrial crops. Between 1953 and 1977, excluding the period 1961-65 when politics disorganised agriculture, per capita cereal production grew by approximately 1.3% per year and is now probably a little over 300 kg. Considering only cereals for human consumption, the figures would be 1.7% and 190 kg. For the future, increasing yields rather than the areas under cultivation might have the effect of putting total cereal production up by 3 to 4% per year, resulting in per capita production of more than 400 kg by about 1990. But some experts doubt that this figure can be achieved and recall that, in defiance of the forecasts, such rates of growth were not reached in the past. In any event, increasing agricultural production will continue to be one of the Chinese leaders' main objectives up until the end of the century and the trend of agricultural productivity might well limit the opportunities for industrialisation.

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(1) Policy in this regard seems to have progressed during the last few months.

(2) See Section 1 of Part I of the report.

. As regards industry, assuming a continuing consensus on priorities (in particular concerning imports of capital goods), and bearing in mind past performances, an average growth of 10% per year could be sustained until the end of the century. By then, China would be producing 6 to 7% of world industrial output, which would make it a significant industrial power.

In 1975, consumer goods accounted for 35% of China's industrial output and capital goods for 65%. During the next decade, the emphasis will probably be placed on accelerated development of :

- energy resources and electricity production;
- iron and steel (with a crude steel target of 60 million tonnes by 1985);
- transport and communications (railways, telecommunications);
- the electronics industry (components, electronic instruments, telecommunications equipment).

Naturally, it is probable that this industrial development will be largely concentrated in the Eastern provinces, particularly the coastal provinces which already have a long tradition in this field.

. Finally, with regard to overall growth, the study carried out by R. Machetzki for INTERFUTURES considers that a rate of growth in national income of 6 to 7% per year is altogether representative of past trends, once the periods of political conflict have been excluded. It is the lower of these two figures that INTERFUTURES has used in its scenarios. On the basis of this rate, China's share in world income should increase from 6 to 10% over the last 30 years of this century. As to per capita income, it would be about $1,000 although this figure must be viewed with extreme caution owing to the uncertainties of the present situation and of the future outlook.

With national income growing at an annual rate of 6 to 7%, energy consumption could be between 1,400 and 1,800 MTOE by the end of the century. Since China has considerable coal reserves and some oil reserves on the mainland, without counting the probable resources of the continental shelf, these requirements would be met out of national production, and China could even be exporting a modest amount of energy by the end of the century.

The pattern of development that has just been outlined will entail imports of capital goods from Japan and the other major industrial countries. It is difficult at present to assess to what extent China will be prepared to incur debts in order to accelerate capital accumulation (1). In any event, it will probably have to develop its exports in order to limit the size of its external debt. This raises a question. Will a burst of Chinese exports (at present of negligible volume) on the international market for manufactured goods disrupt the trade flows as from 1990, especially for products with a high labour input, at the expense of other Third World areas? Nevertheless, leaving aside the need to export in order to contain indebtedness, it seems reasonable to suppose that, in view of the incomes distribution policy, industrialisation will be accompanied by extensive development of the domestic market, at least in the urban and eastern part of China.

It is at the turn of the century that China's economic role will probably begin to become important.

Thus, by the end of the century, China will not yet be one of the developed societies, but the eastern part of the country might have become a significant industrial power and, if it has mastered its food and population problems, its political power will have increased considerably.

The overall prospects for the Third World

What features of the Third World's probable future emerge from this regional analysis?

- *the ever-present risk of socio-political upheavals;*
- *the vast scale of the changes in income distribution between countries;*
- *the continuing problem of absolute poverty;*
- *the increasing differentiation between various groups of countries.*

What then is the overall picture of the Third World at the end of the century revealed by an analytical approach? How far does it add to, and confirm, the picture given by the worldwide scenarios?

. An analysis by country and by region reminds us, firstly - if this were necessary - of the possibility of more or less fundamental socio-political upheavals affecting one Third World country or another and occasionally upsetting the economic and political equilibrium of a whole region. Such upheavals can take many forms: civil wars between different ethnic groups; border conflicts between countries; revolutions and counter-revolutions. Over-rapid development may prove just as dangerous as no development at all, for while the latter slowly builds up tensions, the former increases the likelihood of clashes between conservatives and "modernists", between the groups which benefit from the trend and those which do not. Revolutionary upheavals will bring about changes in development strategies and in relations with the developed countries. But there is no certainty that they will result in more efficient management; nor that, despite the opposition to past development strategies which they express, they will result in greater attention being paid to the needs of the poorer segments of the population.

The political instability of certain developing countries, caused by the magnitude of the internal and external challenges these countries have to surmount, is a source of uncertainty for the world economy as a whole. By curbing the expansion of those countries' foreign trade and their inflows of international capital, it often lessens their prospects of development whilst, with the growth of interdependence, it increases the vulnerability of the developed economies.

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(1) According to some estimates, the accumulated total of China's borrowing might be $35 billion in 1985.

. The study confirms the vast scope of the changes that will be taking place between now and the end of the century in the distribution of the world's population in terms of per capita national income. Despite the obvious limitations of this type of criterion, Figure 2 says a great deal:

- If the threshold of development is fixed arbitrarily at $2,500 (1976), the countries coming within the group of developed countries would then have a total population of some 760 million. The present population of these countries is 470 million. So, the proportion of the world population which, in terms of per capita national income, is above the threshold of underdevelopment is approximately 12%.

- If, at the other extreme, $300 (1976) is taken as the limit for poor countries, those above it would have a combined population of 1,650 million at the end of the century compared with 1,280 million at present. Between 1976 and 2000, the percentage of the world's population living in countries with a per capita income of less than $300 would have fallen from 32 to 28%. This disappointing figure is due to the assumption in the calculation that the average per capita national income of India will remain below $300. If it exceeds this figure, the proportion would fall to only 12%.

. The study also emphasizes the difficulty of solving the problem of absolute poverty by the end of the century. The two major critical areas are still likely to be South Asia (including Indonesia) and Sub-Saharan Africa. The INTERFUTURES estimates give the same results, in order of magnitude, as those of the World Bank. The latter, in its basic scenario, shows low per capita income in the two main Asian and African regions as growing at 5.1 and 4.1% annually. The number of people living in a state of absolute poverty falls, according to the Bank, by nearly one-half in percentage terms (from 52 to 27% of the population) between 1975 and 2000, but hardly at all in absolute terms : from 630 to 540 million. The Bank accordingly gives an alternative scenario, but its commentary is very direct: "In the base scenario, the poorest 60% of the population received 18 to 25% of the increments to income; in the alternative scenario, their share is assumed to be as much as 45%. This is the highest known to have been achieved by any developing country apart from the centrally planned economies. Under these conditions, absolute poverty could be virtually eliminated in the Middle Income countries, but would still afflict 13% of the population in the Low Income countries in the year 2000. The extreme optimism of the assumptions underlying the alternative scenario should be underlined". (1). A realistic bracket for these regions is probably between 400 and 700 million inhabitants living in extreme poverty at the beginning of next century.

The two areas of poverty differ, however, in one major respect. Whereas "balkanised" Sub-Saharan Africa includes many countries whose small size and/or land-locked situation may place some limitations on their development strategies, the governments of the Asian countries can to some extent deal with the problem themselves. Their resulting relationships with the developed countries are accordingly fundamentally different.

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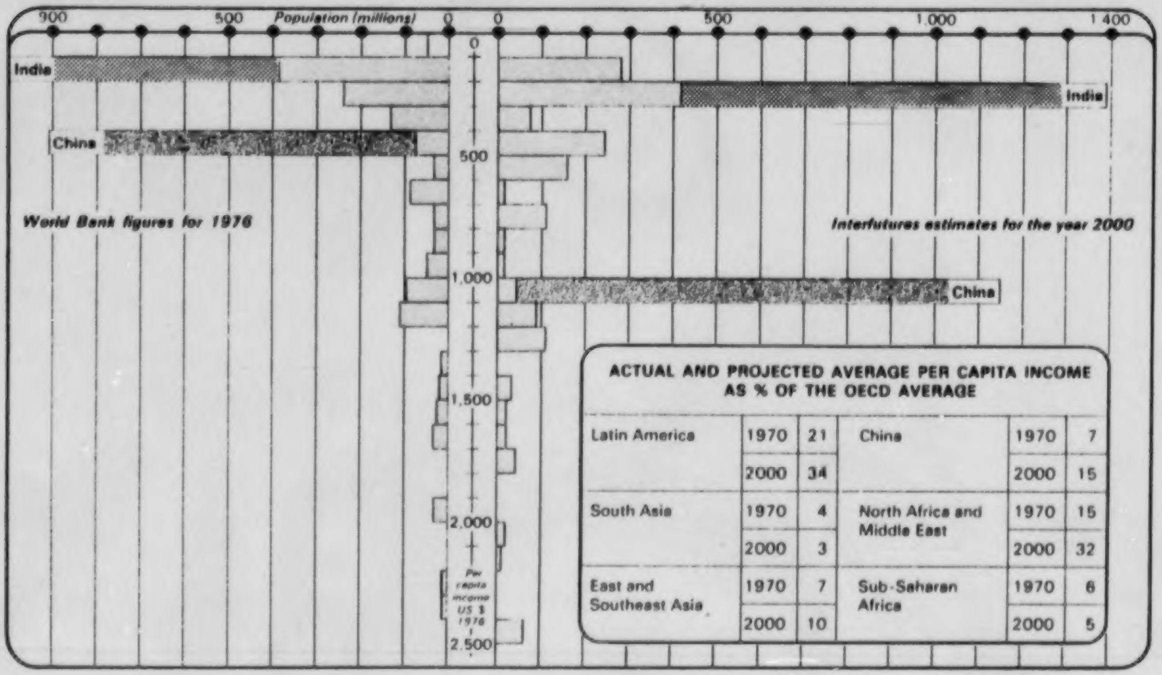
(1) World Development Report, op.cit.

Figure 2

Distribution of world population with respect to GDP per capita
in 1976 and 2000



ACTUAL AND PROJECTED AVERAGE PER CAPITA INCOME AS % OF THE OECD AVERAGE

Latin America	1970	21	China	1970	7
	2000	34		2000	15
South Asia	1970	4	North Africa and Middle East	1970	15
	2000	3		2000	32
East and Southeast Asia	1970	7	Sub-Saharan Africa	1970	6
	2000	10		2000	5

Lastly, the outline survey enables us to group these currently heterogeneous countries by types. Provided that this is not regarded as a strict classification but rather as indicative of typical situations, they may be put into five groups (1) :

(1) Countries which are becoming industrialised on an increasingly diversified basis. These fall into two clearly defined subgroups :

- two medium-sized Asian states - South Korea and Taiwan to which should be added the city-state of Hong Kong and Singapore;

- the large South American countries : Brazil, Mexico and to some extent, Argentina.

Unlike the countries in the first list, those in the second have some characteristics of underdevelopment such as the existence of a poor population and deprived areas.

(2) The much more heterogeneous group of countries that are becoming increasingly industrialised like Algeria, Iran, Venezuela, Malaysia, the Philippines, Pakistan, Nigeria, Kenya, the Ivory Coast. At one extremity are countries which could in very favourable conditions move into the first group; at the other, are those whose chances of moving out of underdevelopment by means of industrialisation are highly doubtful, such as Pakistan. In all, these countries will nonetheless play a not inconsiderable part in the worldwide redeployment of industrial activity, as they will take over activities making intensive use of unskilled labour, which are at present being undertaken by the first group.

For most of these countries, agriculture will remain an essential activity, often much more important than industry.

(3) Countries whose exports of natural resources decisively influence their growth possibilities (countries which in other respects sometimes belong to the groups previously mentioned).

. Some of these countries occupy an important position on the market for one or more minerals or primary commodities: Saudi Arabia and the other OPEC countries for oil; Zaire, Zambia, Chile and Peru for copper; Thailand, Malaysia, Bolivia and Indonesia for tin; Jamaica and Guinea for aluminium; Malaysia for rubber; Ghana for cocoa and so on.

. Some of them occupy only secondary positions on the markets for a number of products, such as Ethiopia and Tanzania in Africa, or Guatemala and Paraguay in Latin America, but their economies are nonetheless dependent on this branch of activity.

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(1) Some countries may be attached to more than one group.

(4) The very poor countries with few natural resources or prospects of industrialisation. For them, progress in agriculture is even more necessary than for the former groups.

Depending on their size, they will remain highly dependent on external aid, like the Sahel countries, or could develop their own strategies, as could Bangladesh if it succeeded in overcoming internal obstacles to development. But in any event, the role of aid will depend on the absorptive capacity of each of these countries.

(5) Lastly, the continents - China and India - where regional differences are concealed by political unity. Their size gives them the characteristics of all the groups :

. India is already a significant industrial nation - and, what is important, a producer of capital goods - but agriculture still accounts for 47% of total value added.

. China, if it brings its population growth and agricultural development under control, will attain the rank of a great power by the end of the century, even if its per capita income is then no more than US $1,000 at 1976 values. It is not impossible that China will then play a leading role in international trade.

The progressive differentiation of the Third World, as revealed by the analysis of its various regions, is clearly not in the least incompatible with the persistence of social or economic similarities, nor with the strengthening of cultural or religious solidarities (like those which may result from the rebirth and spread of Islam) nor with the maintenance of the political solidarity of the Group of 77.

The strategies of the developed and developing countries may modify these features appreciably.

Furthermore, even if some of the features of this picture of the Third World are powerful trends which will not shift significantly, the strategies of the developed and developing countries may influence the future to an appreciable extent, as we have pointed out for each of the groups of countries; but in order to understand better the influence that these various strategies may have, we must now consider the possible evolution of interdependence between the advanced industrial societies and the Third World.

3. THE VARIOUS ASPECTS OF INTERDEPENDENCE BETWEEN THE ADVANCED INDUSTRIAL SOCIETIES AND THE THIRD WORLD

North-South interdependence takes many forms: this report concentrates on the economic dimensions of an interdependence that is likely to increase.

This interdependence takes many forms : economic interdependence, represented by financial transfers, migration, trade in raw materials and manufactures;ecological interdependence, illustrated by the possible effects on the climate of an increase in the concentration of carbon dioxide in the atmosphere; military and political interdependence; diplomatic interdependence, generating an increasing number of international conferences; and cultural interdependence, resulting from exchanges of information.

Developed countries and developing countries have two complementary conceptions of interdependence. For the developing countries, dependence has been one of the prime features of their political, economic and cultural evolution for decades; so now they insist on the need for an equitable interdependence. For the developed countries, dependence on certain developing countries has been a recent discovery; so they emphasize the reciprocal nature of the influences.

This report concentrates on the economic aspects of interdependence, although in the long run, other aspects such as cultural interdependence will prove to be quite as essential in North-South relations.

But it is necessary to reason in terms of future interdependence, not the present situation. So first there is a question that must be asked. Will there be, as many writers believe, an intensification of economic interdependence, or might there be a major break between North and South, with the Third World seeking in collective autonomy a way to development based on satisfaction of its essential needs? (1). The scenario C analysis suggests that because of the Third World's growing diversity this second possibility is extremely unlikely, though this naturally does not exclude the possibility either of isolationism in major developing countries such as India, or of the accession of many Third World countries to real autonomy in decision-making. The most likely conjecture, therefore, is that this interdependence, the first signs of which go back to the beginning of the 16th century, will continue to grow at an increasing rate.

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(1) The Bariloche Foundation has taken up this second alternative in its model which examines the possibility of autonomous development of three developing continents: Latin America, Africa and Asia (excluding the USSR and Japan). Cf: "Catastrophe or New Society: A Latin American World Model", IDRC, Ottawa,1976.

By way of studying six essential areas (energy, commodities, agriculture, industry, science and technology) the report endeavours to answer two questions :

The existence of this interdependence poses two problems which must be examined before we consider the possible strategies of the developed countries :

(i) In the future how strongly and in what direction are the economies of the developed and developing countries likely to influence one another?

(ii) In the above context what is the likely effect of the policies followed by the governments of the two groups of countries?

- How strongly and in what direction may the developed economies and the developing economies influence one another?

- What effects may the policies adopted by the governments of the two groups of countries have?

So far as the first question is concerned, it must be said at the outset that the most widely differing arguments have been propounded in recent years: while certain experts of the developed countries stress the importance, for growth in the Third World, of renewed growth in the developed countries, other authors point out that the economic development of certain Third World countries (especially in Latin America) has never been so marked as during the Second World War; the RIO Report suggests that reducing food consumption in the countries of the North could improve nutrition in the countries of the South, while other studies argue that there is no significant connection between the two; some are alarmed at the invasion of the developed countries' markets by Third World industrial products, while others consider that the industrialisation of the Third World may be one of the main driving forces of future growth. It is therefore necessary to try to discern what interdependence will actually involve in the future.

The second question implies a judgement in two matters: what is the overall economic optimum resulting from the most efficient use of resources; and how is world output to be distributed among and within countries? Reasoning in terms of mere transfers between North and South does not enable us to assess the real impact of possible policies.

Interdependence is by nature unsuited to sectoral analysis but such an analysis is nonetheless necessary to an understanding of the worldwide interrelationships involved. There are six main areas in which economic interdependence will be found: energy, primary commodities, agriculture, industry, science and technology, and financial transfers. As the industrial area is very important and has been comparatively little studied, it will be dealt with at greater length.

The energy interests of the developed countries and the Third World coincide to a great degree.

Energy

Energy interdependence between North and South already takes two forms :

(i) international trade links all these countries via the distribution of fossil fuels, mainly oil and coal;

(ii) the Third World needs technical assistance and often finance from the advanced industrial societies in order to exploit its traditional energy sources or develop new forms of energy.

Before examining the problems raised by this interdependence, we should first recall a few figures. Depending on the scenario, projections of end-of-century energy consumption in the Third World, less China, range from 2223 MTOE (scenario D) to 2776 MTOE (scenario A). The midpoint B2 scenario puts the regions' respective shares at 54% for Latin America, 20% for East and South-East Asia, 16% for South Asia, 7% for North Africa and the Middle East, and 3% for Sub-Saharan Africa. The International Energy Agency, for its part, has drawn up a 2560 MTOE situation-outline which has the advantage of suggesting primary-source energy balances for the non-OPEC Third World countries and for the OPEC countries (Tables 38 and 39).

For the non-OPEC developing countries demand increases more than fourfold in 25 years, and although domestic energy production increases 4.5 times, import requirements increase threefold. Nothing can illustrate better both the considerable effort which these countries will have to make to develop their own resources and the competition there will be with the developed countries for oil supplies as soon as there is any strain on the market.

For the OPEC countries, demand increases 7.3 times and supply only 1.6 times (a figure which may moreover be optimistic). Exports thus increase by only 30%.

Built into these overall estimates are different export and import situations at the level of countries and continents: among the non-OPEC countries, the East Asian countries and, to a smaller extent, South Asia and Sub-Saharan Africa are importers, while Latin America, North Africa and the Middle East are net exporters.

Three conclusions emerge from this :

- For the non-oil producing developing countries, whatever their level of development, growth will greatly depend on the availability and price of energy.

- In the event of a world energy crisis, the situation of the Third World countries with no energy resources of their own will rapidly become dramatic if they cannot borrow on preferential terms.

- The future production policy of the OPEC countries will have a determining influence on the prosperity of both the developed countries and many other Third World countries.

For the developed countries, the policy implications are clear :

- They should adopt consistent and forceful national energy policies so as to make the world energy situation less critical.

Table 38

Energy balance sheet of the Third World (excluding OPEC countries and China)

(Million TOE)

	1975	1990	2000
Growth rate %	5.3 (from 1960 to 1973)	5.6 (from 1975 to 1985) 4.7 (from 1985 to 1990)	4.7 (from 1990 to 2000)
Elasticity	1.39 (from 1960 to 1973)	1.24 (from 1975 to 1990)	1.07 (from 1990 to 2000)
Energy demand			
Solid fuel	82	182	248
Oil	274	681	1043
Natural gas	33	90	176
Hydro/geothermal	51	130	199
Nuclear	1	61	199
Total	441	1144	1865
Energy supply			
Solid fuel	78	182	251
Oil	168	577	684
Natural gas	41	98	186
Hydro/geothermal	51	130	199
Nuclear	1	61	199
Total	339	1048	1519
Net imports			
Solid fuel	4	-	- 3
Oil	106	104	359
Natural gas	- 8	- 8	-10
Total (1)	102	96	346

(1) Excluding transport

Source : International Energy Agency (1978)

Table 39

Energy balance sheet of the OPEC countries

(Million TOE)

	1975	1990	2000
Growth rate %	7.2 (from 1960 to 1973)	7.5 (from 1975 to 1985) 6.0 (from 1985 to 1990)	6.0 (from 1990 to 2000)
Elasticity	1.15 (from 1960 to 1973)	1.25 (from 1975 to 1990)	1.10 (from 1990 to 2000)
Energy demand			
Solid Fuel	1	9	22
Oil	58	220	415
Natural gas	30	119	205
Hydro/geothermal	5	10	14
Nuclear	-	9	37
Total	94	367	695
Energy supply			
Solid Fuel	1	9	22
Oil	1546	1895	1992
Natural gas	30	310	530
Hydro/geothermal	5	10	14
Nuclear	-	9	37
Total	1582	2233	2595
Net exports			
Oil (1)	1488	1675	1577
Natural gas	-	191	323
Total	1488	1866	1900

(1) Excluding transport

Source : International Energy Agency (1978)

. To limit tension between North and South on the question of sharing oil supplies, and to prevent world equilibrium from being jeopardized by a slowdown in the growth of the Third World, the developing countries should be helped, either directly or through the international organisations, to exploit their fossil fuel resources (oil, coal, gas) and to obtain nuclear energy when their level of consumption or situation warrants it. Cooperation in the field of new sources of energy (biomass in particular) is also highly desirable.

. Consideration must be given immediately to the question of how these countries may be guaranteed a certain supply of oil (or the means to obtain that supply) in case of shortage.

. The developed countries should endeavour to evolve a policy of cooperation with the OPEC countries to permit development of extraction capacity in harmony with the resource potential. Admittedly, the interests of consumer and producer countries diverge on one essential point - the price of oil - but it is important to keep the divergence in proportion in the long-term perspective: the OPEC countries have nothing to gain from sudden, sharp price increases that would cause a slowdown and recession in the world economy, whereas for the consumer countries it is not logical to want oil to be priced so low that oil-saving and substitution are unnecessary, with the result that even steeper price rises become inevitable. So there is a sort of price bracket within which the conflict of interests is waged.

Primary commodities

Commodity exports are a vital constituent of Third World trade.

Thanks to the many studies made in recent years, the main issues in this field are beginning to be better understood. Admittedly, they are not confined to a context of North-South relations as more than 70% of world mineral production, for example, comes from elsewhere than the developing countries. Primary commodities do, however, play an essential part in the exports of the Third World (Table 40).

Stabilisation of prices and the method of functioning of international trade are among the major issues in this field.

Of the four questions that have been identified : stabilisation of prices, the method of functioning of international trade, the siting of processing plants, and the role of the economic transactors controlling resources, only the first two will be dealt with here, the third being discussed under the heading of industrial interdependence. The fourth, which goes beyond the North-South context, will be dealt with in the last part of this report.

Two main ways of avoiding price fluctuations have been proposed:

- stabilisation through stock-building policies;

Stabilisation of prices. Because of the structure of demand and/or supply, commodity prices fluctuate widely in the short term. The progressive synchronisation of business cycles in the developed countries and the possible intensification of climatic irregularities offer little hope of any improvement in the future. Such ups and downs are obviously unfavourable to both consumers and producers, but they are particularly harmful to the Third World countries which have to adapt their investment policies to the value of their exports.

Table 40

Shares of specific products in exports by value
of certain developing countries (1974)

Country	%	Product	Country	%	Product
Gambia	93,7	Groundnuts	Mauritania	71,5	Iron
Zambia	92,7	Copper	Jamaica	67,5	Bauxite/ Aluminium
Burundi	84,3	Coffee	Chad	67,2	Cotton
Bangladesh	84,1	Jute	Chile	66,7	Copper
Togo	76,4	Phosphates	Liberia	65,5	Iron
Zaire	73,2	Copper	Ruanda	62,0	Coffee
Uganda	72,7	Coffee			

Source : D. Kebschull, W. Künne, K.W. Menck : Das Integierte Rohstoff-programme, Hamburg, 1977

- stabilisation of actual export earnings.

So this is another field in which the two groups of countries have largely the same interests.

There may be a case for giving higher priority to stabilisation of export earnings over the whole range of commodities and, for some countries, even for all exports.

Two main ways in which to limit these disadvantages have been proposed : stabilisation of prices by stockbuilding policies, and stabilisation of actual export earnings. What might be the long-term effects from the point of view both of distribution and of efficiency?

As concerns efficiency, stabilisation of prices by stockbuilding policies raises difficult technical problems, as is illustrated by the case of tin (since 1956) and that of cocoa (since 1972). To prevent unsuitable choices of intervention prices, speculative manoeuvres and political pressures, and to keep finance requirements to a minimum, the best thing would probably be to try to develop a buffer-stock system that would permit upward and downward adjustments around the medium-term trend. The ideal solution would seem to be one involving an automatic shift of the maximum-minimum price bracket. Here, monetarist thinking on fixed versus floating exchange rates might be very helpful. In particular, a pre-agreed system of automatically self-adjusting parities would be preferable to frequent ad hoc adjustments. As to management of the buffer stock once it had been created, this should be assigned to an independent body rather than left to governments.

However, given that any system is bound to be less than perfect, and probably increasingly so as time goes on, there is no certainty that the net result would be positive, when storage costs, financing, transaction costs and management expenditure are taken into account.

As to the income-distribution effects, these must be considered from two angles: as between consumers and producers, and among producers themselves. For the producer - depending on the pattern of supply and demand - they may serve to stabilise or destabilise his income, they may raise or lower his average income.

Empirical analysis indicates that the number of commodities for which price stabilisation definitely benefits the developing countries in efficiency and income-distribution terms is very small (1). Of the 17 commodities normally regarded as economically and technically amenable to world market price stabilisation by means of buffer stocks, only five agricultural products (coffee, cocoa, jute, wool and wheat) receive clearly positive efficiency and income gains in the analyses. The net effect for the other commodities is uncertain. As regards minerals, there are some indications that international price stabilisation would essentially benefit the industrialised consumer countries rather than the developing countries.

Another study (Behrman, 1977) concludes that stabilisation of prices within a 15% bracket would improve and stabilise the incomes of exporters for the five following commodities: coffee, cocoa, rubber, rice, timber and sisal.

But these analyses are based on fairly theoretical assumptions which make no allowance for other possible advantages of price stabilisation, especially indirect advantages like an improvement in long-term demand prospects for certain commodities or a lessening of the incentive to develop synthetic substitutes. Nevertheless, it seems important to stress that in as complex a field as commodity price stabilisation, any decision has to be anchored to an exhaustive study of the economic and institutional characteristics of each market.

This approach, however, does not enable us to evaluate the impact for each country. For many poor developing countries, their exports of a product are only a small part of the world market for that product (coffee constitutes 55% of Ethiopia's export earnings, but Ethiopia's share of world coffee exports is only 2.3%). For these countries, stockbuilding operations may involve a loss of income if prices are stabilised and there is no compensatory effect when national output fluctuates. Those benefiting most from the policies would be the leading producers of commodities whose supply is unstable: Brazil in the case of coffee, Malaysia for rubber, and Ghana for cocoa are examples - in fact, a limited number of middle-income developing countries.

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(1) Cf. Ezriel M. Brook, Enzo R. Grilli, Jean Waelbroek: Commodity Price Stabilisation and Developing Countries: The Problem of Choice. World Bank Staff Working Paper No. 262, Washington 1977, page 30 in particular.

By comparison, stabilisation of export earnings has undeniable advantages. It always stabilises incomes (by definition), an essential consideration since this enables the developing countries not only to solve their balance of payments and exchange rate problems, but also to regulate their overall economic development, improve the conditions in which this development is planned and alleviate their debt-management difficulties.

There are other advantages, too. Operating costs are lower; less information is required (the main problem being to establish a realistic forecast of the export trends of each country); and the benefits are distributed differently (1).

This analysis suggests that there is a case for the developed countries combining the two alternatives, with greater priority for the second, that of stabilisation of export earnings. This would have the advantage of making the commodity production and trade structure less rigid and contributing to more flexible and more diversified economic development.

As regards the functioning of international commodity trade, three themes are uppermost currently : indexing, cartel formation or, on the other hand, multilateral liberalisation of this trade.

The functioning of international trade. The policies discussed above do not substantially affect the present functioning of markets; but the situation is quite different for three other ideas frequently put forward: index-linking, cartel formation or, on the other hand, multilateral liberalisation of international trade.

(i) In a long-term perspective the proposal to index-link the prices of commodities to those of industrial products encounters two major objections :

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(1) According to simulated results for the period 1961-72, almost two-thirds of payments under such a scheme would have been made to the exporters of copper, sugar, rubber, coffee and cotton. The developing countries with a per capita income of more than $750 in 1972 would have received 10 times more per head of population than those with a per capita income below $200 (6 times more if India is excluded from the latter group). On the other hand, there would have been little difference in the percentage of national income received in proportion to the country's per capita income. Regionally, the payments received by the African countries would have been twice as great as those received by Latin America or Asia.

- From the point of view of economic efficiency, however imperfect the markets on which the prices of commodities are determined, such indexing, by introducing distortions in the trend of relative prices, would involve large and growing losses over a period of time for both producers and consumers. Shortages, surpluses, artificial substitution, and investment wastage would be the inevitable consequences of such a measure.

- As for the income distribution effects, it is not clear that they would be acceptable, as the developing countries having few resources would be penalised, while countries such as Australia, Canada, South Africa and the USSR would benefit - assuming that the long-term prices of raw materials did not tend to rise more rapidly than those of industrial products ! There are many better ways in which resources could be transferred to the poorest Third World countries.

(ii) Since the rise in oil prices in 1973, the possibility of restrictive commodity agreements, i.e. cartelisation of markets has been studied at length. The minimum requirements to be met are draconian : a high concentration of supply, homogeneity of the commodity concerned, low price-elasticity of demand and high elasticity of supply, a market independent of substitutes and recycling, and real ability on the part of the members of the cartel to agree on rules to govern prices and quantities, and on the sharing of benefits and losses. These requirements are rarely met at the level of the whole developing world, but this would not be true in the long term for certain commodities if the producers of the West, East and South formed associations among themselves. However, the political conditions for such associations do not seem likely to be met.

We may nonetheless wonder what would be the effect on the Third World of a rise in the prices of a whole series of commodities. McNicol (1976) has made calculations for 14 commodities on the basis of a 20% rise (Table 41) using short-term price elasticities. The result is a net transfer of $ 4.1 billion at 1971 prices ; half the gross income increase goes to the producers of sugar and copper and more than 80 per cent goes to them and to the producers of cocoa, cotton and coffee. At the same time, however, more than a billion dollars has to be borne by the importing developing countries. Naturally, the benefits would decline in time, as in the long term demand is much more price elastic than in the short term.

(iii) In contrast to a policy of cartelisation, we may imagine one of multilaterally negotiated liberalisation of international trade in primary commodities, since the restrictions on imports into the developed countries are far from negligible : admittedly, the nominal barriers are low for raw materials, both mineral and agricultural, that do not compete with the products of developed countries, although quality and health regulations considerably increase the actual level of protection. But these barriers (nominal or actual) increase where competing raw materials (sugar, meat, vegetables, dairy produce) are concerned, and become higher still for processed commodities, thus protecting the processors in the developed countries.

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Table 41

Consequences of a 20% rise in the export prices
of primary commodities (in millions of dollars annually)

Commodity	Increase in earnings of developing countries	Increase in import costs of developing countries	Net effect
Cocoa	386	12	374
Coffee	501	21	480
Tea	119	41	78
Wool	273	207	60
Cotton	504	145	359
Sugar	2123	679	1444
Bananas	31	2	29
Jute	22	8	14
Sisal	25	1	24
Beef	33	1	2
Rubber	170	17	153
Copper	831	110	721
Tin	161	11	150
Iron ore	211	5	206
Total	5360	1260	4100

Source : McNicol, 1977, Calculations valid at 1971 prices and volumes.

Liberalising trade in primary commodities and lowering customs duties would yield large and increasing beenfits in the long term for the developing countries and for consumers in the developed countries. The World Bank has attempted an estimate of the volume of the benefit to the developing countries of full liberalisation of trade in 17 agricultural products (crude ores not being included because of the low level of customs duties). (Table 42).

Two-thirds of the benefit would go to the producers of meat, vegetables and sugar. By continents, Latin America would receive two-thirds, Asia 20% and Africa the remainder. Per head of population, the middle-income countries would be the main beneficiaries.

Similar calculations have been made to assess the effects of lower duties on processed goods. For agricultural products, liberalisation greatly increases employment in the developing countries in view of the labour-intensiveness of the techniques used by the processing industries. The effect is much less marked in the case of ore processing because of the capital-intensiveness of the techniques used.

Table 42

Increase in value of agricultural exports
of developing countries
resulting in 1985 from full liberalisation of trade
(in millions of 1975 dollars)

Beef	1539	Palm oil	119
Fresh vegetables	1102	Tobacco	110
Sugar	1020	Fruit preserves	105
Maize	551	Wheat	95
Wine	352	Sorghum	78
Rice	160	Meat preserves	60
Bananas	144	Oranges	42
Vegetable preserves	131	Other	55
Coffee	119	Total	5789

Source : World Bank, Prospects for developing countries, 1978-1985, 1977

On the whole, it seems that liberalisation of trade would favour the poor developing countries more than restrictive commodity agreements.

There are undoubtedly mutually beneficial ways of improving the functioning of markets in the long term without depriving them of their regulating effect.

This analysis leads to an important conclusion : in this very sensitive field of primary commodities, there are without doubt mutually beneficial ways of improving the functioning of markets in the long term without depriving them of their regulating effect (automatic stabilisation of prices through stock building operations ; stabilisation of export earnings as far as possible ; multilaterial liberalisation of trade with reduced protectionism vis-à-vis processed commodities).

It ought therefore to be possible to work out constructive policies, but these must take account of other aspects of North-South relations (agriculture as a whole, where agricultural products are concerned ; industry, in the case of ore processing) and of worldwide interdependence in terms of raw materials.

Agriculture is the vital economic sector for many Third World countries. It is therefore relevant to consider past performance, future demand for food products, the main features of the Third World's food problems and the options open to it, before discussing agricultural interdependence as such.

Agriculture

Agriculture is the largest sector of the economy of most developing countries. Its share of GDP is generally between 30 and 40% but ranges from 20 to 60% and is commonly two or three times greater than industry's share. Between 50 and 90% of the total labour force is employed in agriculture. Agricultural exports frequently provide 50% of foreign exchange earnings and even 80 or 90% in some countries. Yet in spite of the social and economic importance of agriculture, most developing countries during the past 10 to 15 years have allocated only 10-20% of gross investment to that sector.

So before tackling the problems of agricultural interdependence as such, it is relevant to consider past performance, future demand for food, the essential features of food problems in the Third World and the options open to it.

(1) Past performance of agriculture

During the last 10 to 20 years agriculture has been largely neglected by many governments of developing countries, with serious economic and human consequences. Nevertheless, though with wide inter-country differences, growth of agricultural production in the Third World was considerable in the 1950s and 1960s.

This low investment is symptomatic of the neglect of agriculture by many developing country governments over the past 10 to 20 years. They have regarded industrialisation as the sole route to higher economic growth and modernisation of their economies. In many instances they have adopted investment or pricing policies which were actively biassed against agriculture. These governments have ignored the fact that most of their countries require a dynamic agricultural sector, at least in the early stages of industrialisation, to supply food for the rapidly expanding urban markets, raw materials for industry and capital for the development of industrial and social infrastructure.

The economic consequences of these strategies have been low and irregular growth in agricultural productivity, limited capital accumulation in agriculture and inadequate flows between it and other sectors of the economy. Associated with the above has been the growing dependence on imported basic foodstuffs and agricultural raw materials (such as cotton) for industry. These imports in turn have pre-empted a large proportion of the limited foreign exchange earnings of many developing countries, and thus reduced imports of capital goods or raw materials for infrastructural development or agricultural and industrial production (particularly fertiliser). The slow growth in rural incomes has held back the development or reduced the productivity of the urban consumer goods industries and the agro-industries up and downstream of the primary sector, thereby undermining the industrial strategies the governments are trying to foster.

The human consequences of these strategies have been increasing undernutrition and rising underemployment and unemployment in rural areas. Relative to urban areas, improvements in education and health standards in rural areas have been less and in some instances these standards have deteriorated. This has held back the decline of rural fertility rates, thereby increasing the pressure on rural resources and stimulating rural-urban migration.

Although the growth in productivity has been low, and the increase in output below requirements, the Third World's expansion of food and agricultural production in the 50s and 60s was substantial. Gross agricultural production and food output both increased by about 130% over the last 25 years. Even over the period 1971-1978, during which a number of countries experienced serious drought or flooding, the average annual rate of increase in Third World wheat and rice production was 3.3 and 2.3% respectively.

But here, too, the aggregate picture is misleading, since in many countries production has failed to keep up with population and income growth, and increases in per capita production have been low or negative, particularly in Sub-Saharan Africa, South Asia and some Central American countries. Regional and income disparities within countries also alter the aggregate picture, since they distort the

the distribution of the food supply. Consequently the food intake of low-income groups appears to have deteriorated in recent years in a number of countries.

(2) Future demand for food

Effective demand for food in the Third World will increase by 3 to 4 % a year on average.

The increased import demand will come from countries with a comparative advantage in other areas, and from low-income countries in South Asia and Africa. In this latter group the import-share of consumption will remain low, but it could be steeply reduced by cutbacks in storage and distribution losses.

As discussed in Part I the future growth in the Third World of effective demand for food, assuming high economic growth, could require more than a doubling of grain production between 1979 and the end of the century. Even with such an expansion there would probably continue to be a food requirement which is not met by the market because people lack the purchasing power. Even on the most optimistic assumption, i.e. INTERFUTURES scenario A, 10% of the Asian population, China excluded, and 25% of the population of Sub-Saharan Africa, in other words some 350 million people, will be suffering from malnutrition in the year 2000. Uncertainties as to long-term economic growth and changes in income distribution make it impossible say more than that demand is likely to grow at between 3 and 4% per year for the Third World as a whole, with somewhat wider commodity and country-to-country differences.

In 1977/78, Third World countries imported about 40 million tonnes of grain from OECD countries, i.e. about 10 % of consumption on average, but for certain countries 25 % Various studies have concluded that if the supply and demand trends of the past 10-15 years are maintained and if the gap between the two continues to widen, the shortfall in production could be 80-100 Mt in 1990 and up to 140 Mt by the end of the century. On these assumptions grain imports in the year 2000 would represent on average 18 % of consumption and for some countries as much as 50 %. These projections make no allowance for the price movements which would occur both nationally and internationally if the supply-demand disequilibria were so extreme and which would directly or indirectly reduce the gap between domestic demand and supply. Nonetheless, the import requirements of some 20 developing countries will be high over the next two decades.

It is misleading to generalise about the present or future grain deficit of the Third World. These are some countries which are likely to continue to be essentially self-sufficient at least in basic foddstuffs, e.g. Colombia, Burma, Thailand, Kenya and Malawai, and others which have been significant importers from time to time but have natural resources to maintain low import requirements, e.g. Zambia, Zaire, the Philippines, and Pakistan. Thus the projected deficit is likely to stem from two groups of countries.

. About one-half is likely to be in countries which have comparative advantages in other areas, such as the OPEC countries, the newly industrialising countries and raw material producers, which will probably have adequate foreign exchange earnings to import their needs.

. The other half would be in the low-income countries of Sub-Saharan Africa and South Asia, which have climatic, institutional and infrastructural constraints that cannot be rapidly removed, and whose future foreign exchange earnings are likely to be too small to pay for major food imports. However, the projected deficit of this second group is only about 5 % of the projected trend production, except for a few countries where the proportion may reach about 15 %. Given that distribution and storage losses in these countries are 10 to 40 %, and the mean close to 35 %, a major effort to reduce such losses could appreciably reduce the projected deficit - the mean could be reduced to 20-25% within a decade. Furthermore, the performance of this second group is very much dependent on what happens in India, since that country accounts for a major proportion of the projected deficit. It is unlikely that India's deficit will grow so large ; it has ample physical and institutional resources to maintain a high degree of self-sufficiency in terms of effective demand.

(3) Underlying features of the Third World's food and agricultural problem

While the official policy of many developing countries is to give priority to small-farmers, short-term pressures and institutional factors have often caused distortions adverse to subsistence farming. This has frequently resulted in a worsening of the terms of trade for this sector, marginalisation of many small farms and an increase in rural poverty.

It is essential to examine the nature of the Third World's present food problem, since it is in dispute. Some regard it as a supply problem following from investment and technological constraints, others as a demand problem, i.e. effective demand is too low. Both views are an oversimplification, but the latter is generally valid. The food problem is not simply a rural or agricultural problem ; it is a broader socio-economic problem, i.e. people are too poor to buy or grow all of their food needs. Yet farmers, whether they be rich or poor, will only grow more for the market if this does not depress prices or reduce their net earnings. Thus it is essential to make a basic distinction between effective (that expressed through the market or in subsistence production) demand and nutritional demand for food, the latter being a function of the physiological requirement for food to maintain health and productivity.

Given that 70-90 % of the population of the developing countries are directly or indirectly dependent on agriculture, much of the lack of effective demand must originate in the farm sector. Many studies indicate that the rural income problem (monetary or non-monetary) is centered on the small farmers. Collectively they occupy 50-75% of the arable area under cultivation, and produce a similar proportion of total output, but largely for subsistence. The official policy of many countries gives priority to the small farmer, but short-term expendiency or institutional factors have led to biases in favour of the large farmer or landlord. Limited access to credit facilities and key production inputs has constrained the rises in productivity of the small farmer. Additionally, small farm production has been inhibited by penal land tenure systems, by weak marketing infrastructure and the lack of crop distribution roads, etc., and by factor-product price distortions in favour of the urban populations.

A common outcome of these distortions has been the strengthening of the dual agricultural economy which has been present in many countries for several years. The small-scale subsistence sector, whilst producing the bulk of the food, has shown the slowest rate of increase, or none at all in per capita terms, whilst the large-scale, modern sector which accounts for a significant proportion of both food and export crop production, has commonly expanded rapidly. The latter, unlike the subsistence sector, is less restricted by the lack of effective domestic demand, is much more price responsive and has achieved, and will probably continue to achieve, large gains in productivity. However, as the Ivory Coast, Kenya, Malawi and Malaysia have shown, small farmers can be successfully integrated into export crop production ; large-scale enterprises are not a prerequisite. Nevertheless, the policies practised in many countries have resulted in a deterioration in the terms of trade of the traditional sector, the marginalisation of many small farms, and an increase in rural poverty.

(4) Third World options for enhanced agricultural production

Third World agriculture must be developed in order to promote social equity and strengthen political stability.

Production can be increased by expanding the area under cultivation or by increasing productivity per unit of land. In either case, productivity gains presuppose the removal of infrastructural and institutional constraints, and the development of technologies appropriate to certain crops or ecological areas. The employment effects could be substantial.

These are more limited than those which were available to OECD countries in the early stages of their industrialisation, when rural unemployment was a serious problem. In OECD countries the agricultural revolution started before and overlapped the industrial revolution ; thus most of those displaced from agriculture or drawn from it by higher urban wages, were able to find work in the towns. Alternatively they were able to take part in colonisation or other out-migration ; options which are not generally open to the Third World. The agricultural and industrial revolutions of the Third World are more or less taking place at the same time, and the industrialisation process is commonly less labour-intensive and less dependent on agriculture for raw materials than in the OECD countries when they were at a similar stage of development.

Consequently, Third World agriculture must be developed to promote social equity and political stability. Without higher rural incomes, health and nutrition standards will deteriorate, urban migraton may become overwhelming and the development of the consumer goods industries will be held back. It is impossible for industrial development to provide productive employment for the roughly 300 million currently unemployed or underemployed, and for the additional 700 million projected to enter the potential labour force by the year 2000. Agriculture, together with the agro-industries and the food processing and the food retailing sectors are potentially able to make a greater contribution.

As to the actual options available, there are several different ones depending on the ecological and social constraints and their interaction. They vary widely from country to country, region to region within countries, and amongst social groups at the village level upwards.

During the 1950s and 60s about two-thirds of the increase in production came from the expansion of the area under cultivation, and one-third from greater productivity per unit of land.

- The former remains an option in Latin America and some countries of Africa and Asia. They have large areas which can be readily and fairly quickly put under cultivation, particularly the savanna ; but in many respects their vast land resources are apparent rather than real in the short to medium term. This is because (a) they are unevenly distributed amongst countries, with Brazil and sparsely populated Zaire possessing the largest, (b) appropriate technologies have yet to be developed for sustained intensive production in both the semi-arid and the high rainfall areas, (c) most countries do not have the human or financial capital resources to quickly develop the appropriate R&D and extension infrastructure, and (d) the required socio-cultural changes cannot be accomplished rapidly. Without (b), (c) and (d) there will be a loss of soil fertility and of land through erosion, deforestation and desertification.

- The land development option does not exist in many of the most densely populated food deficit countries; therefore the increased output has to come from greater production per unit of land. In irrigated areas and others with regular rainfall, the latter can be achieved in two ways : (a) multiple cropping, whereby more than one crop per year is harvested from the same piece of land and (b) higher yields per harvest. Such developments are vital in those areas with adequate water resources, and great land scarcity, but irrigation tends to receive disproportionate attention in agricultural policies. The potentially irrigable area of the Third World is more than 300 million hectares, but there are a further 800 - 1,000 million hectares of currently cultivated or potentially cultivable land for which water resources do not exist, and hence will always depend on natural rainfall. This land is currently (or potentially) critical to the livelihood of many farmers, and it is essential that a better balance is introduced into the support given to irrigated and rainfed farming.

Either way, gains in productivity presuppose two major changes. The first is the removal of the institutional and infrastructural constraints (for India and many other countries this would be enough to ensure adequate production over the next 10 years without major investments). The second change would be the development of technologies for certain crops (millet, cassava) and ecological areas (e.g. parts of the tropical rainforest zone and some arid and semi-arid regions). Current expenditure on R&D for these areas is only in the region of 10-50 US cents per hectare, yet they have to support a large agricultural population.

The employment consequences of such rises in agricultural production will depend greatly on whether stragegies emphasise increases in output per hectare or output per man. The net effect can be one of substantial direct and indirect employment creation, provided that there is balanced growth of demand, supply and productivity. To these benefits must be added those arising from increased consumption by farmers of their own produce, higher savings ratios and other multiplier effects throughout the economy.

In the many countries which are currently importing food, or in the few countries that can compete on the world market, productivity can rise faster than domestic demand without causing unemployment. Once self-sufficiency is reached or external markets become saturated, unemployment may result unless there is growth in the indirect demand for cereals from the livestock sector, and a switch to food or non-food crops with higher income elasticities. This could occur in many countries. Furthermore, productivity gains are likely to stabilise or lower the relative price of food and thereby increase effective demand for food, and higher agricultural incomes should raise the rural demand for urban-produced consumer goods and farm inputs, thereby increasing urban incomes and the urban demand for food.

It has been argued that rising labour productivity will inevitably cause a net reduction in the agricultural labour force in the short to medium term. This is not necessarily the case, and was not so in Japan, Taiwan and South Korea where rises in productivity were paralleled by slow to moderate growth in the agricultural labour force and rising agricultural incomes over long periods together with fast growth in employment in rural and urban activities dependent on agriculture. Nor has it been the case more recently in many parts of India.

(5) Agricultural interdependence

Agricultural interdependence has four main aspects : factors of production, commodity markets, incomes and employment, processing of food products.

As pointed out above, agriculture will remain a critical sector throughout the next half-century. Agricultural interdependence has four complementary aspects : factors of production upstream ; commodity markets downstream ; incomes and employment ; and lastly, processing of food products.

But interdependence has also to be considered from the standpoint of two major tasks ; facilitating the expansion of agricultural production in the developing countries, and setting up machinery to meet fluctuations in output, as this is the only way of gradually reducing the gap in the Third World between effective demand and demand which would do away with malnutrition (1).

Energy, fertilisers and pesticides are the main agricultural production factors for which there is interdependence between developed and developing countries.

Interdependence and production factors. Energy, fertilisers and pesticides are the stragegic sectors here.

Agriculture in most of the OECD countries would be severely affected by major reductions in OPEC oil supplies, as it would be difficult in the short term to replace oil by other forms of energy ; but the developed countries could easily give priority to agriculture since its energy requirements represent only 4% of total consumption.

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(1) There is no time-frequency pattern for crop failures. What is more, the probability of a widespread run of bad years is by no means negligible. So, although current stock levels are high in the main importing and exporting countries, many countries are still vulnerable to a series of poor harvests at home or abroad.

OECD area production of nitrogen fertilisers and pesticides is also highly dependent on OPEC oil, with the exception of the United States, the United Kingdom and the Netherlands which have their own natural gas resources.

Many developing countries in turn largely rely on nitrogen fertilisers and pesticides produced by OECD countries. Their food output and exports of cash crops would be critically reduced if this possibility were not open to them. During the 1974-75 fertiliser shortage, a number of developing countries had to reduce their fertiliser consumption and steps were taken to help them. Since then, OECD countries have been helping the developing countries bilaterally and multilaterally, to raise their domestic supply capacity. Given that it is not feasible to have buffer stock operations for fertilisers, the OECD might consider introducing compensatory financing schemes so that during shortages, the developing countries would be provided with foreign exchange to compete on the open market for their import needs.

For phosphate fertiliser, the positions are reversed, with European countries and Japan heavily dependent on supplies from Third World countries ; but some of the latter are dependent on grains produced by OECD countries with the phosphates. Reduced phosphate applications for two or three years would not seriously affect OECD area yields, but thereafter could be significant. In the medium term, however, the United States and Australia could replace Third World suppliers, though at a higher cost.

Pesticides are produced in the OECD area by multinational companies, using petroleum-based feedstocks, although after 1990 coal-based feedstocks will probably start to replace petroleum-based ones. Without the use of pesticides, world agricultural production would be seriously reduced. Present pesticides, however, are to a significant degree tailored to the application technologies, crops and pests of OECD countries, because development costs are high. In the developing countries, the multinational companies concentrate on the main pests affecting the dominant crops, and production facilites are mainly restricted to the formulation of commercial preparations from active ingredients produced in OECD countries. This limited activity stems from uncertainties as to the short-term commercial returns to private-sector pesticide development for relatively minor crops or regions. The OECD countries might consider commissioning the multinational companies to help the developing countries to produce pesticides and application technologies more suited to their problems and resources.

In a North-South direction, the impact of the Third World's food deficit on the developed societies is unlikely to be significant within the time horizon of this study.

Interdependence and markets. If trade flows are aggregated, there remain two main residual streams :

(i) In a North-South direction, the commodity chiefly concerned is grain. Potential demand in the Third World has already been discussed. On the supply side, only North American, Australia, the EEC (subject to prices) and perhaps Argentina could expand production quickly enough to meet a major wheat and maize deficit, part of the rice deficit predicted by some analysts would have to be covered by developing countries like Burma and Thailand.

Rather than strategic dependence of the Third World in agriculture, one should speak of interdependence, since the main grain-deficit countries are the OPEC nations and the newly industrialising countries.

The currently voiced concern that a rapid levelling-off of yields per hectare in the United States, combined with a high level of domestic and international demand for grain, will lead to big price increases and inflationary pressures does not seem grounded. It is unlikely that yields will level off very rapidly. Western Europe and the USSR should have relatively low import requirements up until the end of the century if present policies are continued. Assuming a steady increase in demand and no climatic change, grain production in the United States - and to a lesser degree that of the other countries mentioned above - should be able to satisfy domestic demand, the import requirements of the other developed countries (20-30 MT) and the effective demand requirements of the Third World (80-100 MT) up until 1990, without major increases in farmgate prices or environmental problems.

The analysis thus leads to two conclusions :

. The Third World's food deficit should not have very much impact on developed societies within the time horizon of this study.

. If sectoral relationships are considered, we should speak of interdependence in agriculture rather than of strategic dependence by the Third World : the main developing countries with grain deficits are the OPEC countries and the industrialising nations whose economies are becoming increasingly integrated with those of the OECD area. The primary commodity exporters, particularly mineral exporters, form the bulk of the smaller grain-deficit developing countries. The only countries that are really dependent are some African and South Asian countries which rely heavily on food aid and agricultural imports, and whose exports are not essential to the OECD countries.

In a South-North direction, the food vulnerability of the developed countries has been exaggerated.

(ii) So far as imports from the South are concerned, agricultural interdependence has often been seen in the developed countries as a source of vulnerability. Hence the defensive policies in this matter. Actually, pressure from the South for further reductions in tariff and non-tariff trade barriers is becoming more intense.

What are the dangers for the developed countries of increased dependence on imported food? It must be admitted that the vulnerability argument has been overstated. On the OECD scale, none of the primary or processed foods currently imported from the developing countries are nutritionally of strategic importance. More than 30% by value are beverages and spices of little or no nutritional importance, sugar accounts for another 10-30%, and the remainder are vegetable oils, fruit and vegetables which are inessential supplements to or substitutes for other OECD area food products. Collectively, they form about 5% of average daily calorie intake. From this standpoint, the percentage could safely be increased to 10 or 20% if redeployment of some agricultural production to the developing countries were accepted by OECD countries.

Three aspects of interdependence in terms of incomes and employment should be mentioned :

- *the impact on the Third World of the developed countries' domestic agricultural policies;*
- *the effects of food aid;*
- *the consequences of short-term fluctuations in grain supply and demand and ways to remedy them.*

Interdependence, incomes and employment. Interdependence with the South plays a major part in the agricultural incomes policies pursued by Australia, the EEC, Canada and the United States. In order to maintain farm incomes close to those in industry without increasing government intervention, the OECD exporters of grain and, to a lesser extent, dairy products need a buoyant market in the Third World. Without it, they would have to pay higher subsidies to farmers or accept a significant restructuring of agriculture, with high levels of unemployment in certain regions. Food aid, subsidised sales and commercial exports also help to prevent the latter. However, in promoting their own economic and social goals, the OECD exporters in the past have delayed to a certain extent the introduction of essential infrastructural and institutional reforms in grain-deficit developing countries and inhibit the export potential of others.

From the South's viewpoint, there is obvious interdependence, too. About 100 million people are employed in non-food cash-crop production in the developing countries and another 160 million in the production of fruit and vegetables. A considerable proportion of the former and a smaller percentage of the latter are engaged in production for OECD markets and are dependent on them. In 1975, foreign exchange earnings from this flow were about US $28 billion, compared with agricultural imports from the OECD area of about US $17 billion. One form of interdependence which does not concern the same developing countries is food aid : with the increase in the South's grain deficit and the growing gap between effective demand and food requirements, such aid will become increasingly desirable. What may its real impact be, on the basis of past experience?

- It mainly benefits the poor countries, whereas the middle-income countries may lose, if they are importers, as a result of the rise in world market prices, or if they are exporters, by the limitation of their external markets.

- In most countries, food aid should replace commercial imports and free foreign exchange resources that can be used to create jobs. The direct and indirect effects should be favourable to the poorest families.

- In the past, it was only in India that food aid was added to domestic production, but prices there fell by only 0.2% and production by 3% of the amount of the aid, while 85% of the aid received went to the most deprived groups.

Thus the overall effects of food aid can be positive, even if aid involves the risk for the developing countries of increasing their dependence in an essential sector of activity.

A final aspect of interdependence on the grain market : that of short-term fluctuations in supply and demand, which will continue to affect the world market because of climatic uncertainties, whatever the progress made in irrigation or flood control. The resulting price fluctuations on the international markets are all the greater as the developed countries pursue policies which stabilise domestic prices and unload the whole of the fluctuations on to a comparatively narrow international market. It has been estimated that if adjustments were allowed in domestic prices, cereal stocks above the normal annual ones would be necessary only one year in five, and should not be really large (18 MT) more often than one year in twenty (Johnson, 1977).

As for constituting buffer stocks, simulations by various authors suggest that the main wheat-exporting countries, the United States, Canada and Australia, would experience income losses, while the major importers, Japan, the USSR, India and Egypt would gain, the total surplus being slightly positive for the world as a whole. In the long term, the number of countries benefiting would increase, if the trends in world trade just described are taken into account.

A certain number of studies suggest that a long-term solution might include a combination of three policies :

- the constitution of a buffer stock to stabilise prices (the size of the stock should allow for gradual growth in the volume of international trade);
- the setting-up of an insurance scheme which, over and above a certain level, would compensate the subscribing countries for excess expenditure resulting from the need to import at spot prices if domestic production fell;
- greater flexibility in the domestic prices of the developed countries.

The problems in regard to food processing are closely connected with those arising from industrial interdependence.

Interdependence and processing of food products. Within the OECD countries, a large number of people are employed in processing the agricultural products of the Third World : coffee, cocoa, tea and sugar. Admittedly, the numbers vary greatly from country to country and sector to sector, but on the whole, if the work of processing agricultural products were redeployed between North and South, the number of jobs affected in the medium term might be of the order of a million.

The problems which would result are closely related to those arising from the development of industrial interdependence.

Industry

The redistribution of industrial activities in the world will not be complete by the end of the century. The

In recent years, the increase in exports of manufactures has been an essential factor in the remarkable growth of some developing countries. This success has made a strong impression on public opinion in certain OECD countries, which has seen it, often wrongly, as the main reason for the structural adjustment problems of industry in the developed countries.

advanced industrial societies will constantly be having to make structural adjustments, but the form taken by the Third World's industrialisation will be as important for world prosperity as its volume. The report examines the recent trends in this industrialisation, the global and regional prospects, the characteristics of industrial redeployment and, in particular, the role of the multinationals. It considers a few individual industries and finally discusses the main policy issues raised by interdependences.

What are the likely realities of tomorrow in this field ?

To give as comprehensive a picture as possible, we shall, having first recalled the essential trends of the last few years, indicate globally and by region the possible orders of magnitude of industrialisation in the Third World, identify the main characteristics of this redistribution of industry at world level, illustrate them by means of examples provided by a few significant branches, and finally highlight the main policy issues that this industrialisation raises for North-South relations.

The facts described in this section naturally confirm one of the main findings of Part III : the redistribution of industrial activities in the world, which will not be complete by the end of the century, will subject the advanced industrial societies to constant pressure for structural adjustment; however, these facts also add to this finding on one essential point: the form that the industrialisation of the Third World takes is as important for world prosperity as its volume.

(1) Recent historical trends

Brevity is essential so the risk of caricaturing them has been accepted and they have been condensed into the following five findings:

A rapid growth in exports of manufacturers from a small number of developing countries to the OECD area, centred around a few products and encouraged by multinational enterprises and the marketing companies in the developed countries, these have been the main features of the past trend.

. Between 1960 and 1976, exports of manufactures by the Third World to the advanced industrial societies rose by 15% in real terms, but with certain exceptions they still only account for small percentages of developed-country markets. The share of the Third World (excluding China) in world industrial value added (excluding China) increased more slowly during the same period, except in the latter years: 6.2% in 1953, 7.6% in 1973, and 8.5 to 9% in 1976. Considering only the market economy countries, it accounted in 1973 for 10% of the total.

The income elasticity of demand for Third World manufactures in the developed countries has always been high - of the order of 3 up until recently (Donges and Riedel, 1977) - and, with the exception of products such as textiles and clothing, it has often been Third World supply which has restricted the growth of exports at the outset. The trend is now beginning to move the other way, with the developed countries trying to curb their demand whilst the Third World supply may increase much more rapidly.

. Up until 1973, these exports were concentrated on a small number of product groups: apart from oil products ($4.4 billion in 1973) and non-ferrous metals (3.9), clothing (3.0), products of the metal and engineering industries other than motor vehicles (2.8), textiles (2.4), wood products and furniture (1.8), food products (1.4), footwear (0.9), chemical products (0.75), and iron and steel (0.65). Recently, however, there has been considerable diversification and the comparative advantages of the middle-income countries - for example, Hong Kong, South Korea, Brazil and Mexico - have been extended to activities with a higher input of capital and specialised manpower.

. The number of developing countries which have benefited from this increase in exports is limited; in 1973 and excluding oil products and non-ferrous metals, only five countries exported more than $1 billion of industrial products: Hong Kong (20% of the total) South Korea (14%), Yugoslavia, Mexico and Brazil.

. The growth of imports from the Third World has concerned the whole of OECD area, since in 1973 the EEC absorbed 40.7% of these imports, Japan 11.1%, and the United States 37.3%; naturally, this parallelism is not maintained when the problem is looked at from the products standpoint, or when the impact on the various economies in the EEC is broken down.

. Multinational enterprises and marketing companies based in the developed countries have played an essential role in this development. They have in most cases provided not only the marketing channels, but also information on product design, technical knowledge, management capabilities and financial resources. International sub-contracting and the geographic reallocation of production within the vertically integrated multinational companies have significantly altered the international division of labour. As a result of intervention by the multinationals and the existence in many developing countries of practically unlimited supplies of semi-skilled labour, the supply of industrial exports from the Third World has proved to be very elastic once production infrastructures and distribution networks were established. For the same reason, this supply has shown itself to be very sensitive to price incentives (such as those provided by the US customs code with regard to assembly of components manufactured abroad).

(2) Global and regional prospects

By the end of the century the Third World might account for 24-26% of world industrial value added, but the rates of increase would differ widely from region to region.

According to the high-growth scenario A, the Third World, including China, would be responsible for 24% of world industrial output by the end of the century. This percentage would be slightly higher in scenario B and reach 26%, insofar as China's production may be little affected by the situation of the rest of the world economy. If as in the calculation for the Lima Declaration, the People's Republic of China is excluded from the calculation in both numerator and denominator, the Third World share would amount in both scenarios to about 18% (against 7% in 1973), with an obviously smaller percentage for the manufacture of machinery alone - in the region of 13%. Thus, the Lima target would not be achieved, but there would nevertheless be a substantial change in the structure of world industry, since these figures imply that the Third World, including China, would account for 31% of the increase in world industrial output between 1970 and 2000. The industrial output of the Third World, excluding China, would grow by 7.4% in scenario A (OECD area: 4%) and by 7.1% in scenario B (OECD area: 3.4%).

By region, apart from China's spectacular advance, the most noteworthy development is the progress of the Far East and Latin America. South Asia and Sub-Sahara Africa, on the other hand, remain of secondary importance in world industry. Growth of the respective shares of the various Third World regions over the period 1970-2000 would be as follows: from 4% to 9-10% for Latin America, from 2.4% for South and South-East and East Asia collectively to 1.5% for South Asia and 3.0% for South-East and East Asia, from 0.8% to 1.7% for North Africa and the Middle East, and from 0.5% to 0.8% for Sub-Saharan Africa.

A breakdown by major areas must not be allowed to hide another important phenomenon, which is the rapid industrialisation of the Mediterranean non-Member countries of the EEC which belong to OECD. All the sectoral studies indicate that they are playing an increasingly important role in world industry (for example, Spain as regards motor vehicles).

(3) The characteristics of the redistribution

The Third World's industrialisation will be determined, to some extent, by the pattern of comparative advantage which will change with time. There is reason to fear, however, that the parties involved will radically influence that pattern in a manner adverse to the long-term interests of developed and developing countries alike.

Reflection on the possible policies open to the OECD countries with regard to the industrialisation of the Third World cannot be confined to percentages and rates. It must seek to comprehend the economic, social and political factors underlying these trends, and also the interaction of the three main categories of parties involved, i.e. developing-country governments, multinationals and developed-country governments.

In order to keep to the essentials, the best course is to outline how the comparative advantages model familiar to all students of economics is confirmed or warped in reality:

. In the first place, nothing could be more dangerous than to forget the enormous potential market for industrial products represented by the unsatisfied requirements of an enormous portion of mankind. It is not a question of the developed countries and the Third World having to share a given global demand; they have to construct an industry on a scale sufficient to meet the demands of 12 billion human beings.

. Secondly, nothing is more deceptive than to reason in terms of a small number of sectors considered to be homogeneous. This is to forget the rich variety of the industrial system. Activities are redistributed not only between sectors, but inside sectors and even between the various stages of a production process.

. As a general background, it is true to say that the industrialisation of the Third World countries is determined to some extent by comparative advantages, i.e. it focuses on types of production which make intensive use of locally abundant and inexpensive resources - unskilled labour in particular and, in some OPEC countries, capital reserves - or which correspond to a potential regional market. However nothing would be further from the truth than to imagine that the situation regarding comparative advantage will remain stable in future; technological progress, the development of "human capital", and changes in relative factor costs will change it constantly from one country to another. A significant proportion of these changes will be caused by the industrialisation process itself, which is inextricably bound up with training, apprenticeship in management, and the mastery of techniques. It constantly recreates advantages while at the same time destroying others, in particular because of the increased wage burden to which it gives rise.

However, the actions of the parties involved profoundly modify the simple workings of comparative advantages :

- In the first place, the available technologies produced in the developed countries are the outcome of long efforts to economise that scarce and costly factor, labour, at the expense of that relatively abundant factor, capital or equipment. Moreover, the advantage of such technologies is that they can be largely incorporated in equipment and can consequently be appropriated by the enterprises which develop them.

Despite adjustments made in the Third World countries, it can therefore reasonably be asked whether, in view of relative scarcities, the nature of the available technologies does not demand too little labour and far too much capital.

To avoid any misunderstanding, this argument should be clarified on two points:

. First, in an analysis of comparative advantage, it is the total input of labour and capital in a given activity which is important. So, for example, there would be a case for production units which combined varyingly labour-intensive processes according to their availability on the market. There does not seem to have been enough research done on the technological choices most appropriate to the social, economic and cultural conditions of each country.

. Second, there can be no question of citing the advantage of using more labour-intensive techniques as a pretext for reverting to techniques that are obsolete in our present state of knowledge. It is on the basis of modern technologies and management methods that efforts must be made to find the right combination of factors for each activity.

- As far as the parties involved are concerned, they tend for various reasons to prefer highly capital-intensive technologies: developed-country governments which endeavour to expand exports of capital goods at all costs and grant favourable export credit terms; developing-country governments which, for reasons concerning competition with developed-country enterprises on foreign markets, or for reasons of technical security and prestige, give preference to these technologies; and multinationals which sell or transplant what they have devised in the dominant economies.

- One of the consequences of this, as was stressed several times in the analytic approach, is the relatively small volume of employment generated by industrialisation, and sometimes, as in certain African countries, the relatively high level of industrial manpower wages compared with agricultural incomes. In this case, industrialisation is compatible with increased inequality of income distribution and does not result in a development of local markets for industrial products. This phenomenon is in no way incompatible with the finding (Kreuger, 1977) that export-oriented industrialisation is more labour-intensive and requires less skilled manpower than industrialisation directed towards import-substitution; nor is it incompatible with the fact that industrialisation draws its labour from the poorer population categories and consequently raises their incomes.

- For its part, the cost of capital in the Third World is covered by capital equipment grants and numerous subsidies so that it is undoubtedly negative in a number of operations, even if capital availability remains a constraint on growth in overall terms.

- In this context, it is not impossible that the interests of the multinational enterprises will differ increasingly from those of the developed countries from which they emanate; the multinational companies will seek to get the best of both worlds: financing or research, subsidies for capital goods exports and vast markets in the developed countries; installation grants, low wages, export advantages and customs protection in certain Third World countries.

- Finally, the governments of the developing countries establish their industrial priorities on the basis of criteria which are much broader than mere economic (and social) profitability (as, moreover, the developed countries have often done and continue to do). Some of these criteria are legitimate, like independence; others are more illusory, like those to do with the prestige surrounding basic industries.

Obviously, though, over-generalizations must be avoided and so this picture has to be qualified somewhat :

(i) The possibilities of capital/labour substitution are not the same in every sector, e.g. in textiles and nuclear energy. They therefore have to be determined in each case by firms according to the range of available technologies, but the signals conveyed as to the respective social costs of factors and the technologies available also have to be correct.

(ii) Developing-country situations differ widely in respect of manpower, skill levels, especially where semi-skilled labour is concerned (for instance, training seems better in the Far East than in Latin America).

(iii) Both in the developed countries and in the developing countries, the advantages granted differ enormously from country to country.

Always keeping these caveats in mind, there is still reason to fear that the present direction of world industrialisation is tending towards a wastage of both capital and labour:

- a wastage of capital in the form of over-equipment of production facilities, when some of this capital could be usefully allocated to infrastructure, public services and agriculture;

- a wastage of labour through insufficient job-creation, resulting in a more restricted distribution of incomes and a slower emergence of mass consumption markets for industrial products in the Third World.

As to the backlash for the industrial structures of the developed countries, it may consequently assume a different direction and intensity from what it would have done if relative scarcities were better reflected in price systems.

(4) The role of the multinationals

Multinational enterprises will continue to play a vital role in the redeployment of world industry. Insofar as their geographical area of operation is necessarily different from the nation-demarcated area to which governments refer, this may set problems for the governements of developed and developing countries alikes.

In studying the outlook for North-South industrial interdependance, special consideration must be given to multinational or, preferably, transnational enterprises. Their depth of technical knowledge, their aptitude for management, their ability to attract financial resources and their adaptability make these undertakings a vital force in the redeployment of world industry. But the fact that they control scarce resources permits them some degree of latitude as to the aims they pursue and gives them their own international area of operations which is very different from the nation-demarcated area to which States constantly refer. This combination may prove to be a source of conflicts with the nation-states, with a different power relationship between enterprise and State in each case. But the whole must be viewed in a dynamic perspective. At each stage of world industrial development, the transnational corporations naturally take into account the interests of their shareholders, their techno-structures and their customers, and may therefore generate on the fringes of their operations-areas both a positive surplus and external diseconomies. But as new markets develop, so the geographical pattern of their relative interests shifts, their attitudes change and the nature of their technological research alters. At the same time, the industrialisation of certain countries strengthens the internal cohesiveness of the domestic economy and consequently their governments' involve themselves in the negotiations with the transnational corporations.

It therefore seems likely that even if they are rejected by some Third World countries, the transnationals will continue to play a vital part in the redeployment of world industry - but they are diversifying. Korean, Brazilian and Mexican transnationals are beginning to come on the scene; OECD-country transnationals will become increasingly multinational in their objectives, their personnel and their activities; transnationals funded by public capital will be set up. This is a desirable trend insofar as a world economy with only governements as the active forces in international relations would forfeit much of its efficiency and adaptability, but a trend which will pose problems both for developed-country governments and for developing-country governments and which will necessitate a mutual observance of rules:

- by the multinationals, which will have to comply with the rules laid down by governements and take account in their choice of policies of the economic and social consequences of their action for each national society;

- by individual governments, which will have to create a stable regulatory environment which will enable the multinationals to have long-term development programmes, failing which they will oblige these enterprises to concentrate their activities in "safe" countries and thus lose a unique means of development.

Underlying all this is a problem which will become increasingly inescapable: namely that of international arbitration procedures (incumbent on governments and, naturally, on transnational corporations) and machinery for multi-government assurances.

(5) Some industry examples

Some industry examples will highlight the specific North-South aspects of the outlook for industrial redeployment.

Without going into strategies for individual industries (see Part V), it is worthwhile at this point to try to identify the specific North-South aspects of the outlook for industrial redeployment. Copper, aluminium and steel have been chosen to illustrate various aspects of the basic industries: textiles, shipbuilding and motor vehicles, or the traditional manufacturing industries, and capital goods and electronics or the advanced technology industries.

The cases of copper, aluminium and steel are indicative of the changes to be expected in basic industry.

The basic industries. Substantial changes are taking place in this sector under a great variety of influences: the location of mines, the relative trend of demand in the developed and developing countries, cost levels (of energy in particular), the perceived intensity of environmental constraints and, lastly, political risks. However, from the mining of ores at one extreme to final consumption at the other, different reallocations will appear throughout the production processes and depending on the metal.

Whereas in the case of tin, the ore-producing countries have already built their own foundries, and the factories remaining in the developed countries concentrate on recycling, the situation is appreciably different in the case of other metals.

Where copper is concerned, world consumption of refined metal should not increase over the next twenty-five years by more than 3.3% per year, from 8.5 million tonnes in 1976 to 18.6 in the year 2000, the share of the Third World (excluding China) growing by only 8 to 11%. As regards mining, the Third World share (without China) is expected to increase from 41% in 1976 to 47% in the year 2000, China's own share rising from 1.9 to 5.0%. At the same time, the OECD share will probably decline from 34 to 27%. However, there will be substantial reallocation between the developing countries to the advantage of Mexico, Peru, Chile and the Philippines. At the other end of the production process, at the stage of refined copper production, the OECD countries will account for no more than some 40% (compared with 52.9% in 1976), the share of the Third World excluding China rising over the same period from 21 to 35%, and that of China from 2.7 to 4%.

Unlike copper, use of aluminium will not diminish in intensity before the end of the century and world consumption of the metal could grow from 17.6 million tonnes in 1976 to 50 million tonnes in the year 2000. At the same time, ore-based metal production should show a spectacular increase from 13 million tonnes in 1976 to approximately 42 million tonnes in the year 2000. It is at the foundry stage that fundamental changes will take place in the international distribution of activities, the new alumina and metal production units being established in countries with low population densities and low energy costs. The OECD area share of total production will probably fall from 68.6 to 56%, the Third World (including China) simultaneously increasing its percentage from 10.4 to 27%. Apart from India (from 1.6 to 2.4%), Mexico (from 0.3 to 0.6%), Brazil (from 1.1 to 4.3%), and China (from 1.4 to 2.4%), which have already been producers for a long time, the new producer countries should make a spectacular leap forward from 4.5 to 15.7%.

The third example is iron and steel. It is forecast that world crude steel consumption will be between 1,600 and 2,000 million tonnes by the year 2000, compared with 681 million in 1976. The developed OECD countries would probably consume between 47 and 50% of this total, the centrally-planned economies 30% (including China) and the rest of the Third World a little over 20%. As regards production, of which a quarter would be supplied by electric steel-making and three-quarters by oxygen steel-making, the breakdown, all grades combined, would be the same between the three groups of countries: in the region of 17% for the Third World without China (compared with 7% at present), and 9% for China. However, the Third World share is uncertain owing to several factors: in the first place, the determination of these countries' governments to develop their steel industries; secondly, various forms of protectionism in the developed countries, the unfavourable impact of energy prices on the competitiveness of small production units (in particular, electric-furnace direct reduction plants), and the technical trend towards increasingly large integrated steel complexes.

Inside the OECD area, production will be developed in Canada, Australia and Spain, while in the Third World there will be substantial increases in Brazil, Mexico, Venezuela, China, India, South Korea and Iran.

Textiles, shipbuilding and motor vehicles are three traditional manufacturing industries where the dynamics of industrial redeployment are quite different, even though the underlying mechanisms are comparable.

The traditional manufacturing industries. In this field, the textiles sector has become the prototype for industrial redeployment. This is because it illustrates many important aspects of world industrial trends, whose significance extends well beyond the textiles sector alone.

Let is first consider the past. Except in the centrally-planned economies, the increase in consumption of textile fibres has been particularly modest during the last 25 years. What is more, between 1964 and 1974 per capital consumption rose more slowly in the developing countries (19%) than in the developed countries (21%) where cases of market saturation are already very prononced. Apart from the influence of the climate, the cause is probably the persistence of enormous inequalities in income distribution in many Third World countries. This is a direct measure, therefore, of the impact of development strategies on consumer demand in the Third World.

But although, taking all uses and all fibres combined, there has not been any reallocation at consumption level other than that caused by demographic factors, production structures have changed. Between 1958 and 1975, production indices for the developed and the developing countries increased by factors of 1.76 and 2.00 respectively in the textile industry, and by 1.5 to 2.6 in clothing industry. Thus, intra-sectoral specialisation gives the global phenomenon its real content at the level of each individual branch.

These facts have obviously had repercussions on international trade; between 1964 and 1974, world trade grew at annual rates of 9.7% for fibres, 15.6% for textiles and 20.3% for clothing. During the same period, Third World exports to the market-economy developed countries grew at annual rates of 5.1% for fibres, 19% for textiles and 33.9% for clothing. In 1975, therefore, the Third World accounted for 35% of the developed countries' total imports of clothing. The important point to stress, however, is both the extremely varied way in which the different OECD countries have been affected, and the major role played by a small number of developing countries, particularly Hong Kong, South Korea and Taiwan. The Multi-Fibres Arrangement and the negotiations of 1978 were a direct outcome of these upheavals.

The changed pattern of trade flows in textiles can to a large extent be explained by the respective factor costs:

- Capital-intensiveness in the clothing industry is very low, in the region of one-fifth of its average level for industrial activities.

- In the textile industry as a whole, the capital/labour ratio is scarcely more than half its average level for industry.

- As regards capital/labour ratios, there is no distinct trend towards a change in the relative positions of textiles or clothing compared to other industries.

- Characteristic features of the industry are the above-average proportion of production staff and the above-average percentage of unskilled workers.

However, it would be very misleading to halt the analysis at this state:

- Many developing countries have invested in extremely modern equipment (sometimes beyond what was entailed by strict profitability, over and above direct or indirect subsidies for equipment), with the result that productivity differentials are much narrower than wage differentials.

- Not all the developing countries have succeeded. Those that have become major exporters owe it to the fact that they have assimilated the industrial process in its entirety and, in particular, the marketing stage.

As far as the future is concerned, the growth of textile consumption will in any event be moderate in the developed countries. In the Third World it will depend to a large extent on income distribution; if this continues to be very unequal, growth will probably be in the region of 3 to 3.5% per year, i.e. at the most 1% more than the rate of growth of the population. A broader distribution of incomes to groups already able to meet their basic needs could raise consumption to 4.5/5% per year.

Supply by the developing countries will grow steadily at a faster rate than their domestic demand, with the emergence of new producer countries and a decline in average profitability in the industry. Competition between developing countries will be very keen owing to the number of potential suppliers, the unequal competitiveness of rival producers, governments' export promotion policies, and the developed countries' defence of their markets. For a country to succeed it will have to combine low wages with mastery of the industrial processes. The large enterprises in Europe, Japan, the United States, South Korea and Hong Kong can play an essential role in this redistribution of textile activities throughout the world.

With regard to the developed countries, any analysis which fails to take into account the differences between sub-sectors and their interdependence is useless since these countries will continue to have advantages as regards industrial products, non-woven carpets, furnishing fabrics and fashion-linked articles in particular. Differences will increase, moreover, between the large enterprises capable of taking advantage of the international division of labour, and the marginal firms surviving more or less successfully on narrow gaps in the market for special lines (1).

Shipbuilding. This is another sector with enormous difficulties, but with a different history. From 1960 to 1976, world production of merchant vessels increased from 8,348 gross tonnage to 33,899 gross tonnage. The OECD share only fell from 96.7 to 89.8%. Japan very largely took the place of the EEC. During the same period, the Third World only increased its percentage from 0.5 to 4.7%.

The future promises to be quite different. None of the INTERFUTURES scenarios suggests that maritime transport will continue to grow at former rates. So, in view of existing fleets, the under-utilisation of shipbuilding capacities will continue and may even become more pronounced during the coming decade.

While factors such as location will continue to give the developed countries economic advantages for highly specialised types of ships, the developing countries will be better placed for conventional vessels. On top of this, the governments of these countries will seek to promote this industrial sector, and to give national fleets a growing proportion of their trade. Since shipbuilding will continue to expand in the Eastern countries at the same time, the share of Europe and Japan, which was 80% in 1975, may be no more than 65% by 1985 and will probably continue to diminish thereafter, implying a substantial decline in volume.

With 2.4% of world tonnage produced in 1976, South Korea is already the tenth-ranking world producer. By 1981, its production capacity may be able to satisfy one-third of world demand, and further increases are envisaged for the period 1982-86. This country can therefore be expected to win an appreciable share of the markets of traditional shipbuilders. In Asia, Taiwan and Singapore are already major and growing shipbuilders, while the Philippines and Indonesia have a number of projects, but India's shipbuilding industry does not for the time being appear to be competitive. In Latin America, Venezuela, Argentina, Peru, Colombia and Mexico have included shipbuilding in their development programmes, but the main producer is Brazil (8% of world orders in 1977) which has reserved for its national industry 96% of the growth of its merchant fleet.

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(1) Since the central subject is North-South relations, this paragraph on industry does not mention the Eastern European countries, but they have played a by no means negligible role in the growth of exports of textile products.

The development of the automative industry has made a substantial contribution to the growth of Japan and Europe during the last twenty-five years, and is still flourishing in the developed countries. It is therefore vitally important to review its future prospects.

Third World markets accounted for no more than 6% of world demand for private cars in 1970, compared with the OECD areas share of 87.4%. However demand is approaching saturation point in the developed market-economy countries. After having expanded by a factor of 2.5 in the last 15 years, it could very well increase only from 24 to 34 million vehicles between 1974 and the year 2000, and at the end of the century account for no more than 60% of world demand. Motorisation rates, moreover will still be very different: 370 per thousand in the OECD, 100 per thousand in Latin America (the French rate in 1960) and 14 per thousand in the Asian Third World, including China. In the space of 30 years, however, from 1970 to 2000, annual demand by the Third World could increase from 2 million to 17.4 million vehicles.

At present, North America, the EEC and Japan are responsible for 85% of world car production. Profound changes will be taking place under the threefold influence of geographic changes in demand, the growing differentiation of products suited to the various markets, and shifts in comparative advantage. The changes will be gradual. While low-income countries initially meet their entire demand by means of imports, local assembly follows during the second stage (which has been reached by many developing countries at present); then, in the third stage, the local element in production increases appreciably, the national market is largely supplied by domestic production, and exports grow (this is at present happening in Brazil, Mexico, Spain and certain Eastern European countries) and, in the fourth stage, that of maximum growth, exports may even exceed domestic deliveries. Finally, in the fifth stage, the country may revert to being a net importer by specialising in advanced technologies and activities necessitating highly skilled personnel.

Thanks to rapidly growing domestic demand, import substitution and government promotion of exports, the automotive industry in Latin America should expand rapidly and account for almost 10% of world production by 1990. Brazil, Mexico and Argentina should be the principal producers.

In Asia, apart from India which was responsible for only 0.2% of world demand in 1976, the most spectacular developments are to be expected in South Korea and the Middle East. In the latter region, it is thought that 35% of demand will be covered by local production in 1985, compared with a negligible percentage in 1975.

In the final analysis, the share of North America, the EEC and Japan could very well be no more than 65 to 70% of world production by the end of the century.

Textiles, shipbuilding and motor cars are three examples of manufacturing industries which are very different but where similar developments are taking place with varying degrees of intensity.

In the advanced technology industries, the developed countries will retain their high level of specialisation and therefore influence the forms of industrialisation of the developing countries.

Advanced-technology industries. Whatever their development strategies, the Third World countries will have to expand their investment and, consequently, increase the volume of their capital goods requirements. Yet in 1973 their share (excluding China) in the manufacture of machinery was no more than 3% of the world total. By the end of the century, this could have risen to 13/14%. The developed countries of the West and East will therefore probably retain their high level of specialisation in this branch, whose growth should offset, at least in part, their relative decline in the traditional industries. This phenomenon could be even more pronounced with regard to industrial machinery. As to the Third World, it will probably increase its imports of capital goods from the North substantially. To a large extent technology is incorporated in production goods. Consequently capital-goods content of international trade is going to be decisive in shaping the forms of industrialisation of the developing countries.

The same relative specialisation will take place inside the Third World, since more than three-quarters of machinery production is concentrated in a small number of countries: India, South Korea, Taiwan, Brazil, Mexico and Argentina.

Another advanced-technology industry which clearly demonstrates the diversity of industrial interdependence is the electronics industry which, in conjunction with telecommunications, data-processing and automation, is certainly going to transform the structure of the advanced industrial societies (1). During the last ten years, the rate of growth of this industry has been in the region of 10% per year on a world scale, and the competitive pressures have encouraged multinational companies to redeploy the most labour-intensive stages of the production processes to the low-wage countries - South-East Asia and, to a lesser degree, Latin America. As a result, the share of the Third World is now close to 8% of world production and 12% of exports, while one-quarter of the developed market-economy countries' imports of electronic products come from the developing countries.

In the future, world demand will probably continue to grow annually at rates in the region of 10% up until 1985, and possibly even at higher rates when the new electronics- based consumer goods become more widely available; but the structure of this demand will change constantly under the influence of rapid technological progress which will reduce absolute prices and modify relative prices. As far as production is concerned, there will be changes in the volume and type of manpower required for the various stages.

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(1) Cf: Part III of the report.

This gives some idea of how uncertain the position of the Third World will remain, since it will continue to be governed by subcontracting by the multinational companies in a field where technical progress will, in the main, be concentrated in a few developed countri This uncertainty does not exclude rapid growth, and it is not impossible that the share of the Third World in world electronics will have doubled by the end of the century. Six countries (South Korea, Taiwan, Singapore, Hong Kong, Mexico, Brazil) at present account for 85% of th developing world's exports. Pressure to reduce costs will doubtless extend this list to lower-income countries; however, those of the six countries which have significant domestic markets will probably manage to maintain their positions. Mention should also be made of the two continents - India and China - whose electronics industries will be mainly concerned with satisfying domestic requirements, and a few countries, such as Algeria and Iran, which have stated their intention of creating electronics industries for their domestic markets.

(6) Problems posed by industrial interdependence

Apart from the question of the North's structural adaptability, which has already been discussed, industrial interdependence between North and South raises four distinct issues:
- *the forms of industrialisation in the Third World;*
- *the rules of international trade;*
- *relations between governments and the multinationals;*
- *information.*

Apart from its effects on the internal structure of advanced industrial societies, industrial interdependence raises four questions of differing degrees of importance:

(i) Should not the developed countries encourage forms of industrialisation in the Third World which would make fuller use of the manpower resources available ? Naturally, there can be no question of curbing technology transfers or trying to contest industrial investment in the Third World, since restrictive practices of this kin would only reduce the efficiency of the world economy. On the other han it would be possible to have policies designed to lessen the bias towar highly capital-intensive technologies: technology policies (see below), incentives to multinationals, agreements limiting capital subsidies for equipment purchases.

(ii) How can the developed countries contribute to the integration into international trade of manufactures from the industrialisi Third World countries ?

Present restrictive policies are provisionally protecting employment in the developed countries, but, while providing economic rents for producers in developing countries, hold back the growth in employment in certain of these countries.

For the future, the choice will be between preferential and non-reciprocal treatment demanded by certain developing countries for their exports and a more general liberalisation of trade.

. From the point of view of the developing countries, it may be wondered whether, all told, they would not derive more benefi from the general liberalisation of trade than from non-reciprocal concessions. The reason is twofold. In the first place, exports from the Third World to the developed countries are concentrated in fields in which the comparative advantages are beyond dispute. Reductions in trad due to the erosion of preferences would therefore be small in compariso with the increases generated by a general reduction of duties. In the second place, the generalised system of preferences often grants preferences on customs duties which are already low, excludes important groups of products subject to quantitative restrictions, and limits the exports eligible by country and by product. Moreover, a general liberalisation of trade in industrial products would make the Third World industries more competitive and encourage them to use available resources more rationally. Finally, it would help to develop trade within the Third World, whereas non-reciprocal advantages leave those barriers intact and regional co-operation efforts come up against serious difficulties. Some distinction between countries should probably be made, however. For the more developed, general liberalisation of trade is doubtless the most beneficial course, whereas for the countries which are not very industrialised preferential treatment might be better.

. For the developed countries, the gains from liberalisation would, according to certain studies, be substantial. The difficulty would be that the costs of adjustment would be concentrated on certain industries and in certain regions. For example, for the United States, it is estimated that a general reduction of customs duties of 50% on a multilateral basis would have negligible net quantitative effects in terms of employment.

For enterprises, the development of exports of industrial products is bound to be a long-run affair. Every effort should therefore be made to ensure that countries - unilaterally, without prior consultation and without any transition phase - do not go beyond placing limits to the growth of their imports if they actually reduce them in volume terms, they are likely to ruin the long-turn efforts of dynamic industries.

But the problem of international trade is not confined to issues of North-South interdependence. It is a central aspect of world interdependence as a whole, and as such will be further discussed in Part V.

(iii) How can the developed and developing countries collaborate in regard to multinational companies? The situation for these companies will probably undergo profound changes in the next 25 years: while rejected by those Third World countries which adopt socialist or very reformist development strategies, they will on the contrary be accepted as partners (in particular in tripartite operations with international bodies) by those which are in the process of industrialisation. Given the growing markets and advantages of the Third World, developing countries will become more and more important for the multinationals, which may well find themselves in conflict with developed-country governments as regards adjustment policies. It is quite possible that the result may be, in certain circumstances, a considerable curtailment of their freedom of action, both in the North and in the South. Codes of conduct, arbitration procedures and multi-government guarantees for both North and South may prove to be indspensable if the dynamism of the multinational companies, so vital to industrial development, is to be maintained.

(iv) How can an information system, i.e. a periodic prospective analysis of the various industrial sectors, be instituted which will enable the various parties concerned better to assess the consequences of their decisions in the context of interdependence? This subject, which goes well beyond the framework of North-South relations alone, will be dealt with in the last part of this report.

Science and technology

In the field of science and technology, positive action by the developed countries would have very favourable effects in the long term for the two groups of countries.

This is one of the areas where positive action by the developed countries would have the most favourable effects in the long term. Many schemes have already been in operation for about 20 years and they have been intensified since the beginning of the 1970s, but often they have not measured up to the scale of the problems. The aims would be four in number:

. To encourage to effective use of modern techniques adapted to the economic, social, cultural and ecological conditions of large areas of the developing world; these techniques should be as labour-intensive as possible so as to help increase employment and economise on scarce resources at country level.

. To stimulate research on subsistence agriculture, especially in non-irrigable areas.

. To promote, in the developing countries, scientific research on the special problems of the Third World (for example in the fields of health and agriculture).

. To speed up Third World access to scientific knowledge, so that the developing countries can take part in discussions on the management of common problems such as the climate, the exploitation of the oceans, ecology, energy, etc...

In exchange, it is quite possible that by the end of the century, the developed countries may be importing techniques developed during the industrialisation of South-East Asia or Latin America. India also constitutes an undisputed source of scientific and technical knowledge.

As regards the first of these objectives, several possibilities are worth studying; these include aid to create autonomous technical capacities in the developing countries; such applied research centres would have to have statutes guaranteeing their independence vis-à-vis governments; incentives for the multinational companies to carry out research in the field of adapted technologies or to develop methods combining varied techniques (some of which would be very labour-intensive); the adoption, in agreement with certain developing countries of measures limiting the imperfections of the present market for technology: no obligation to purchase complete "packages", a bigger role for medium-sized firms in the developed countries and for independent consultancy firms, greater efforts in management and technical training, particularly in supervisory functions.

The intensification of scientific and technical co-operation between developing countries is also highly desirable.

For the poorest countries, scientific and technical co-operation with the North might be largely financed by aid, while for those which are already industrialised, it should take the form of jointly-financed and mutually beneficial programmes.

Financial transfers

The Third World's development is inconceivable without the mobilisation of internal resources, but an increasing flow of external financing will nonetheless be necessary throughout the next quarter-century. The major factor in recent years has been the considerable increase in non-concessional flows.

The development of the Third World is inconceivable without the mobilisation of internal resources, but an increasing flow of external financing will nonetheless be necessary throughout the next twenty-five year period. INTERFUTURES conclusions in this connection coincide with those of the World Bank, which recently calculated that a 5% rate of increase in this flow in real terms is an indispensable minimum for overall growth.

Before coming to the prospects and problems specific to the various types of transfers, some past orders of magnitude should first be recalled:

(i) In 1976, total net external resources ($53 billion) financed on average 18% of Third World investment, but for the poorest countries, this proportion was as high as one-third.

(ii) The relative importance of this flow of external capital has grown continuously, since between 1960 and 1976 it increased from 2 to 4.5% of the developing countries' GNP. In real terms, between 1960 and 1976, the overall volume of net inflows increased on average by 10.6% a year, from $17.6 billion to $35.7 billion at 1970 prices.

(iii) At the same time, its composition has changed: two new components - the resources coming from OPEC and bank loans - have become important. It is these components which, with the other flows on non-concessional terms, account for the growth of transfers in real terms, since official aid has hardly increased at all in real terms and represented only 32% of the total flow in 1977 (as against 64% in 1962).

- While most of the capital on non-concessional terms has gone to the higher-income countries, aid has been increasingly directed towards the poorest countries. Thus, in 1976-1977, the poor countries (1), with almost two-thirds of the population of the Third World, received 60% of aid ($8.2 per capita as agains $8.4 for the whole of the Third World), but only 30% of total external flows ($12.7 per capita as against $26.2 for the Third World as a whole).

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(1) As defined in the DAC Chairman's report of 1978, i.e. with a per capita income of less than $400 in 1976.

(iv) Table 43 shows the considerable expansion since the beginning of the 1970s of flows of non-concessional financial resources, due mainly to the development of international bank loans to middle-income countries :

- Between 1970 and 1977, private direct investment grew at an annual rate of about 5% in real terms. It accounts for 36% of the international investments of the DAC countries. Three-quarters of this amount comes from only four countries: the United States, Japan, the United Kingdom and Germany. The principal recipients are, in Asia - Indonesia, Malaysia, the Philippines, India, South Korea, Hong Kong and Singapore; in Latin America - Brazil, Argentina, Mexico, Venezuela, the Bermudas and Panama; in Africa - Nigeria and Liberia. Since 1970, the size of the stock of assets created by direct investment by the DAC countries has grown mainly in Asia, Central America and Southern Europe, but has diminished in Africa, South America, and, because of oil nationalisations, in the Middle East.

- While information on them is incomplete, international bank loans are obviously expanding fast, with competition between lenders even resulting in an extension of the maturity periods granted. On the basis of Table 43 they increased by 50% a year in real terms between 1970 and 1977. In 1977, the main beneficiaries were, in order of importance and excluding the OPEC countries and Southern Europe: Mexico, South Korea, Brazil, Taiwan, Colombia and Argentina. The growth of these loans has gone hand in hand with the emergence of a set of international banks which, like their conterparts, the industrial multinationals, have created their own operating space, but this time in the field of international financial relations.

Table 43

Net total external financial receipts of the developing countries by resource category

	$ billion			%		
	1970	1974	1977	1970	1974	1977
1. ODA(1)	8.9	16.4	21.0	50.6	47.9	32.1
2. Multilateral loans on market terms	0.7	1.8	3.1	4.0	5.3	4.7
3. Direct investment	3.7	3.3	8.8	21.0	9.7	13.5
4. Loans from private banks	0.6	8.0	17.8	3.4	23.4	27.2
5. Other flows on market terms	3.7	4.7	14.7	21.0	13.7	22.5
6. Total at current prices	17.6	34.2	65.4	100.0	100.0	100.0
7. Total at 1970 prices	17.6	23.3	35.7			
8. Drawings on IMF, net	0.4	2.3	1.6			

(1) Including private-sector grants for economic and social development purposes and ODA from planned-economy countries

Source : OECD Development Assistance Committee (1979)

- For export credits, the main providers have been the United States, France, Germany, Italy and Japan: two-thirds of the amounts granted by the DAC countries go to the developing countries, and they finance 9% of Third World imports from the DAC. The beneficiaries this time are Indonesia, the Philippines, South Korea, Brazil, Mexico and Taiwan.

(v) In total volume, official development assistance (ODA) has grown only very slightly in real terms since the 1960s (base 1961 = 100, the index for 1977 was 118); it is decreasing as a percentage of the GNP of the industrialised countries: 0.31% in 1977 against 0.53% in 1961, i.e. less than half of the 0.7% target proposed in 1970, though admittedly with a less restrictive definition (1). It varies widely according to region and country. Including OPEC aid, it ranges from $4.8 per capita in South Asia to $11.7 in Sub-Saharan Africa and nearly $30 in North Africa (2).

Such then is the starting point for future trends and policies.

(1) Financial resource flows on market terms

Financial resource flows on market terms are likely to play an essential role in the future, but institutional measures may prove necessary to ensure a balanced growth of aggregate flows.

Although development depends on other factors besides capital flows and even if a small number of Third World countries cease to be net importers, the developing world's external borrowing requirements are going to be considerable during the next few decades - especially as China will probably be added to the list of recipients.

The size of the flows from the industrialised countries will of course depend on the growth of trade and, more generally, on the nature of international relations. The World Bank's initial assumption of a real growth rate of 5% for non-concessional capital flows seems modest, but more important than the very hypothetical projection of such a rate are the institutional and financial conditions that must be created now to permit a balanced growth of aggregate flows. The situation today is one of relatively plentiful financial resources but a reluctance in the advanced countries to invest. It should therefore be possible to finance Third World projects offering a reasonable rate of return. Apart from the specific problem of the absorptive capacity of certain developing countries, it is of course the effect on indebtedness which is the sensitive issue. At the end of 1977, the developing countries' combined public debt (on a disbursements basis) was about $244 billion, but servicing of this debt represented no more than 12.7% of export earnings for the poor countries and 13.3% for the middle-income countries.

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(1) On the other hand, the objective of 1% for total external contributions as proposed by UNCTAD II (1968) has practically been reached.

(2) See footnote 1, page 206.

The difficulties therefore stem not so much from the aggregate risk as from a bunching of maturities over the next two or three years, the small number of banks concerned (about 30, mostly American) and the size of some countries' debts (1). The real situation is consequently much more strained than the mean percentages would indicate. Hence, the need for special negotiations, but also for wider diversification of capital sources and maturities so as reduce the vulnerability of the international financial system.

In addition to the short-term credits of the IMF and the project financing of the World Bank, it will be important that the developing countries have access to medium-term credits to enable them to progressively restore their balance of payments equilibrium. A number of them also need long-term loans linked to development programmes and not to specific projects.

(2) Resource transfers and official development assistance

Even if there relative importance is destined to decline, resource transfers and official development assistance will continue to be essential in order to accelerate the development of the poorest third of the world's population.

Aid policy should be tailored to the prospects for each of the Third World regions.

This outline shows that there is a real danger that distribution of income over the Third World as whole may become even more inegalitarian.

In these circumstances, it is still desirable that the volume of official resource transfers be considerably increased and this assistance continually reoriented in the light of the lessons of the past and probable future developments. A positive step in this direction has been the OECD countries tendency in recent years to concentrate their aid on the poorest countries or on the poorest sectors in other countries.

Over the last quarter of a century, neither economic effectiveness nor the objective of fairness have been the decisive criteria in aid allocation. Large differences which have nothing to do with economic performance can be observed in the flows to countries with the same per capita incomes and, up to $400 per capita, the volume of aid per inhabitant has increased rather than decreased according to countries per capita income (Chenery and Adelman, 1977). It is only in recent years that aid has come to be concentrated to a certain degree on the poorest and hardest hit countries. One decisive factor has been the nature of the political links between donors and beneficiaries. Inevitably therefore, the effects have been heterogeneous :

- Obviously, aid has played a considerable role as a supplement to internal resources in intensifying growth, meeting immediate urgent needs, ensuring the maintenance of essential activities, in particular in the public services. Without aid, the situation of the poorest Third World groups would undoubtedly have been much worse in absolute terms (Papanek, 1973).

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(1) At the end of 1976, 60% of the outstanding debt total was concentrated in a dozen countries and one-third in four countries only: Mexico, Brazil, India and Indonesia.

- But aid has also helped in many ways to aggravate social inequalities, in particular by accentuating the capital intensiveness of investment, by encouraging the orientation of economic activities in favour of the privileged urban groups, and by holding back trade liberalisation through tied aid; in many cases, it has given rise to development models which are ill-adapted to the economic and social structures of the countries receiving aid.

The next 25 years will probably see an increased concentration of the poor population in South Asia (including Indonesia) and in Sub-Saharan Africa.

Aid policy might therefore be based on the following principles:

(i) Aid should be redefined in the whole context of exchanges (financial, trade, industrial, cultural, political) between industrialised and developing countries. Aid modifies the conditions for such exchanges, but this does not mean that they become one-way transactions. Consequently, there is nothing to prevent a more explicit differentiation between aid on purely humanitarian grounds and aid which also corresponds to commercial objectives. However, this second share of aid should be assigned primarily to infrastructures and agriculture, including the sectors upstream and downstream of agriculture.

(ii) Aid cannot be confined to a commitment in general terms, but must refer to precise development targets which can be used as criteria and standards. Among these, priority must be given to income-redistribution efforts by the governments of Third World countries.

(iii) Aid must be concentrated on the poorest populations. Hence, two sets of consequences :

. Gradual orientation towards the two huge poorest regions (Sub-Saharan Africa and South Asia), with, at the same time, a levelling-off and then a decline in aid to Latin America and the other regions of the developing world (with the exception, of course, of certain very poor countries in those regions). Obviously, this geographical redistribution of aid has to take account of the absorptive capacities of the countries concerned. Views on this subject differ. Some maintain that the poorest countries have a limited absorptive capacity. Others consider that this is not at all the case when aid is extended to small-scale operations, especially in agriculture.

. An endeavour to select action which has an effective impact on the poorest groups and therefore on sectors such as agriculture and the infrastructure. The criterion of "basic needs" recently accepted by all the DAC countries as one of the key principles of their co-operation must remain a desirable guideline, but it will not be easy to abide by it: the achievement of a target of this kind presupposes a fundamental reappraisal of the conception of social life within the country concerned and implies the adoption of internal development strategies which will increase the productivity (and not only the consumption) of the poorest members of the community. Furthermore, it is the whole range of relations with the beneficiary country which are involved. What use would it be trying to satisfy "basic needs" by means of aid if industrial, commercial or financial policies were generating particularly negative effects This gives some idea of the imaginative efforts which remain to be made.

(iv) Even though the actual concept of a volume aid target is being increasingly disputed, it is still desirable, in order to speed the development of the poorest third of mankind, to increase the volume of aid to an initial minimum of 0.5% of GNP for each industrial country (1). The repayment capacity of the poor countries will continue to limit their access to financial markets, and what they do borrow is unlikely to be spent on agriculture and infrastructure. To date, four DAC member countries (Sweden, the Netherlands, Norway and Denmark) have reached the target of 0.7% of GDP. Nine others have pledged to achieve it, but without specifying any time limit. Of these, two countries (Japan and Finland) have recently accounced their intention to double their ODA (Japan by 1980, in dollar terms; Finland by 1982, in aid credits calculated as a percentage of GDP). But where growth of total ODA is concerned, the attitudes of the United States, Japan and Germany will of course be decisive.

Finally, it might be well to reflect on the institutional forms of aid: clubs like the Club du Sahel might be formed to get plans for regional assistance going; the role of non-governmental organisations might be strengthened; an international foundation might even be envisaged to distribute part of governmental aid (see below), since in its negotiations with the developing countries (for example on basic needs), a foundation of this kind would not be a political spokesman for the developed countries.

Beyond sectoral interdependence

There is a very strong likelihood that North and South growth rates will be mutually reinforcing.

This outline of North-South relations in the main economic fields shows how North-South interdependence will grow in some sectors during the next few decades. Admittedly, the different groups of developing countries will be concerned to varying degrees, but they will all be involved, even if some of them have to protect themselves against certain aspects of this interdependence in order to maintain their chosen development strategies.

The study of North-South interdependence has revealed potential sources of conflict, but also opportunities for joint action that would be mutually beneficial.

But the sectoral picture is not enough: the relations between sectors must be considered, too. The description of the scenarios in the next part of the report will help to bring those relations into focus. But this is already the point at which to ask what in the long term will be the impact of a more or a less rapid growth in the industrial economies on the Third World and vice versa.

If the maintenance of an open world trading system is assumed, a study of the scenarios suggests the following conclusions as regards the impact of the North's growth on the South:

. A slowdown in the growth of the OECD countries would slow down growth in the Third World, but very differently as between countries and regions. If the growth rate in the North falls by half a percentage point, so will the growth of the middle-income countries, with Latin America being less affected than the Middle East and the industrial countries of South-East Asia (1). The effect on the low-income countries would probably be no more than one-fifth of a point (2).

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(1) In INTERFUTURES scenario A, aid is conceived as an essential component of integration and reaches 1% of GNP of developed countries by the end of the century. In scenario C, on the other hand, the reduction of this percentage to below its present level is one of the aspects of the break between the North and the South.

. All other things being equal, a slowdown in growth of the OECD countries would tend to narrow national per capita income differentials, not only between North and South but also within the South.

On the other hand it is difficult to put forward any conclusion as to the effect of a reduction in the North's growth on the distribution of incomes within a developing country. The studies by country tend to suggest that, in the present state of relations, the short-term effect would be rather to diminish relative income inequalities.

But what about the reverse impact of the South's growth on the North? The analyses underlying the scenarios and different studies carried out at national level suggest that, structural adaptation difficulties apart, an increase in the Third World's growth rate would induce, assuming maintenance of open trading, a slightly more rapid growth in the developed economies as a whole.

This study of interdependence has certainly revealed potential sources of conflict, but it has also shown that there are many possible courses of joint action that would be mutually beneficial.

It is against this background that we can now return to the original question. What might be the strategies of the developed countries with regard to the Third World ? Putting the question like this does not mean that the developing countries have less responsibility for the evolution of the world economy; it simply reflects the terms of reference of the INTERFUTURES project.

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(1) Since the annual growth rate in the middle-income countries is almost double that of the developed countries, the elasticity of the growth rate of the middle-income countries in relation to the OECD area growth rate is of the order of 0.5

(2) That is to say an elasticity of 0.2

4. DEVELOPED COUNTRIES' STRATEGIES IN REGARD TO THE THIRD WORLD

International relations between the advanced industrial societies and the developing countries pose three major issues for the developed countries: the advisability of strategies, how to take account of similarities and differences of situation, the formulation of consistent policies in the various fields.

Long-term relations between the advanced industrial societies and the developing countries pose three main policy issues for the developed countries:

(i) Should the governments of the OECD countries frame active strategies with regard to the Third World and, if so, what should be the mix between short- and long-term considerations in working out these strategies?

(ii) How could these strategies accommodate both the need to establish new world rules or procedures and the need to take account of the differences in the problems with which countries and groups of countries are faced?

(iii) How can consistent policies be formulated in the various fields where political, economic and cultural independence between developed and developing countries is manifest?

(a) The advisability of strategies

A historical perspective is essential when considering the aims which the developed countries might pursue in their relations with the Third World. This establishes the need for active, global and long-term strategies aimed at bringing about gradual changes.

In recent years, the initiative in North-South negotiations has come mainly from the Third World countries; the governments of the developed countries have, on the whole, merely reacted to the demands made by the developing countries.

This attitude reflects the fact that public opinion in OECD countries is divided on the question of how the developed countries should behave towards the developing countries, and that views differ sharply concerning the implicit or explicit objectives adopted and the strategies proposed:

. What objectives are concerned; some take a moral stance and consider that for ethical reasons - with guilt feelings an additional factor in certain cases - it is unacceptable that there should be such differences in living standards or power between peoples. Others are only concerned with the short- or medium-term national interests and decide purely in accordance with the economic and social implications of the various policies for the developed countries.

. These divergencies also occur where strategies are concerned. Some advocate maintaining the status quo and rejecting the developing countries' demands, either because they consider that the real bargaining power of these countries is limited, or because they believe that the precondition must be a resumption of growth in the North. Others express preference for the rapid establishment of a New International Economic Order with different rules and the creation of a greater or lesser number of intergovernmental agencies. Others, finally, favour limited reforms.

But a broader formulation of the issues is necessary. What has gone before in this report shows how deeply mankind is involved in an irreversible process of progressive and fundamental transformation of world relations that will go on for perhaps the next fifty years or so. When this process is complete, the present developed economies will have become a minority force interms of population and world production. The hierarchy of living standards will have changed completely and the very concept of developed and developing countries will probably have become meaningless.

So rather than to a single ethic or to the balance of costs and benefits, it is to history that one must refer. It gives endless examples of societies whose inability to adapt has put them on an irreversible downward path, and of others which, through their creative power, have survived and flourished despite an upheaval in their environment. From this point of view, a positive response by the advanced industrial societies to the new national and international economic context, and particularly to their increasing dependence with the Third World, will serve to ensure their political and economic security in the very long-term with regard to both their external relations and their domestic situations. Moreover, to judge from the memoirs of the great Heads of State, it was this paramount concern which was reflected in their feeling of responsibility for future generations.

Accordingly, the developed countries cannot afford simply to respond more or less favourably to those demands they judge to be more or less reasonable. They must evolve active, global strategies with regard to the developing world. While showing the tactical flexibility necessitated by short-term considerations, they must build these strategies on an analysis of their probable long-term effects on the advanced industrial countries, the developing countries and the world economic and political situation.

This immediately puts the extreme strategies out of court. Maintenance of the status quo is a fallacy because of the weight of the processes at work and the present unsatisfactory functioning of a world economy. The establishment by a big conference of a New International Economic Order is a utopian concept, since the fact is overlooked that treaties simply stabilise for a time an equilibrium which is in the process of coming about. This leaves the avenue represented by progressive changes and it is vast. It would consist of the following.

1. Tackling North-South problems in a constructive spirit, but without kowtowing to the more extreme points of view of the South;

2. Not seeking to oppose unavoidable trends, but trying to modify them so as to prevent breakdowns and crises in relations.

The strategies of the developed countries might therefore have these guiding principles:

(i) to retain at all time a political vision of the future;

(ii) to help to improve the situation of the poorest countries, to ensure the industrialised Third World countries' integration into the World economy, in the developed countries to find again growth paths with an acceptable content;

(iii) to try to abolish rules and practices which impede equality of economic opportunity within and among nations;

(iv) to give priority to new arrangements, whose provisions are of mutual advantage to the different groups of countries concerned and to propose practical courses of joint action;

(v) to avoid generalisations on a world scale when these are inappropriate for the variety of real problems which the different groups of countries have to face;

(vi) to recognise that the changes will not be confined to short-term financial concessions, but will imply structural changes over a long period, with successive stages in the negotiations and the reform of international institutions.

(b) Accounting for the similarities and diversities

The dual view of the Third World implies simultaneous allowance for the global interactions of the world economy and the growing differentiation between countries.

Since the way in which the developing world is evolving can be interpreted in two ways, depending on whether stress is laid on the global interactions of the world economy or on the growing differentiation between countries, the question is how to tackle the different issues as realisatically as possible.

(1) A first response - and a very natural one, too - is to try to simultaneously make headway on some issues in a global context and on others in the more restricted context of group or even bilateral negotiations. The two approaches have to be regarded as complementary and not mutually exclusive.

However, it would certainly seem that in the last few years both the developed and the developing countries have underestimated the second approach. Yet this is the way to explore realistically all the opportunities for mutual benefit and for implementing specific but effective reforms. It is the approach which helps to make both developed and developing countries more aware of their responsibilities. It affords the developed countries a better knowledge of the impact they have on the developing countries when they enact domestic policies or policies concerning their mutual relations. Finally, it can constitute a foundation for a less abstract global negotiation process. The success of this approach will depend largely on the establishment of different forms of multilateral co-operation. There are already a number (the Lomé agreement, the "Club de Sahel", the co-operation proposed by Japan to the ASEAN countries, the Euro-Arab dialogue, certain forms of regional co-operation in environmental matters). It would be useful to develop them and create various "clubs" whose rules would be drawn up and accepted by all the members and whose assignment would be to promote co-operation in given areas.

The global approach, primarily involves intergovernmental negotiations. Here, a great effort should be made to improve the procedures themselves in order to reduce the difficulties they presently cause. A few ideas can be presented to illustrate this :

. The adoption by the developing countries of maximal positions in an attempt to reduce their internal dissensions and, to some extent, a tendency by the more developed ones to capitalise on the problems of the poorer countries, especially in trade matters, in order to further their own aims.

. The difficulty of combining greater freedom in the analysis of facts and possible solutions with greater strictness in choosing the negotiation issues.

. The representation of countries, given their number and diversity.

. The need for adequate joint preliminary studies, not that these necessarily imply identical positions.

. The risk of over-generalisations with a consequent disregard for the real facts of the situation.

Given these difficulties are recognised, it should be possible to identify the real problems inherent in the functioning of the system of international relations and to single out those which can only be resolved through global negotiations. Jointly-negotiated packages might enable the different parties to obtain reciprocal advantages at each stage.

However, the global approach must not be limited to intergovernmental negotiations. It could also imply, from a non-bureaucratic viewpoint, the development of the international co-operation network, and in particular.

- the strengthening of international financing organisations;

- the promotion of joint operations by these organisations, multinational companies and developing-country enterprises or agencies, etc..

- support for non-governmental forms of co-operation : scientific, technical and cultural associations; research institutes, etc.,

- the setting up of foundations, financed from funds provided by a large number of governments, but managed by independent "trustees" from the North and the different continents of the South: such foundations could be envisaged in two areas in particular:

  . the development of applied technological research adapted to economic and social conditions in the various regions of the developing world;

  . the distribution of a portion of government aid, and also the collection and distribution of money from other sources.

Such a foundation could make aid subject to certain conditions without this being an expression of the political intent of the developed-country governments).

(2) The second response is more concerned with substance. It implies that in the two groups of negotiations account would be taken both of the real differences between countries and of the importance of North-South interdependence in general.

(i) Strategies are conceivable for the different groups of countries. For example:

. For the newly industrialising countries, the developing world's "middle-class", the aim must be to accept them gradually, as economic partners, on an equal footing.

What is no doubt essential for them is a steady increase in their exports; diversification of their economies; ready access to foreign capital; and a share in the management of the world economy. The developed countries, for their part, want to avoid sudden and drastic industrial changes, to develop their own exports and to obtain guarantees for their investments. The problem is therefore:

- for the OECD countries, progressively to do away with the distortions and trade barriers adverse to the newly industrialising countries, reduce (or at least increase) the amount of aid granted to them, provide ready access to the capital markets of the developed countries, but, in exchange, cease to subsidise - by means of loans on special terms - industrialisation which is capital biassed to the detriment of employment;
- for the industrialising countries, gradually to reduce their own trade barriers and the direct and indirect subsidies granted to certain industrial sectors, prevent structural balance-of-payments surpluses, and accept certain types of guarantees for foreign investment.

Trends such as these imply regular consultations in many areas between the OECD countries and the newly industrialising countries. The OECD Secretariat ought to play an important role in these consultations, which would cover trade, balances of payments, the development of industrial sectors and demand management policies.

. The major concerns of the oil-producing countries seem quite clear: to obtain reliable and growing resources from their oil, to ensure the success of their development plans so as to pass smoothly into the post-oil era, and to invest their financial surpluses both profitably and safely. These countries have gradually come to realise that their own development depends on the prosperity of the OECD countries. As for the developed countries, they need regular supplies of oil, without abrupt price changes, and investment which does not disrupt their refining and petro-chemical industries too rapidly. It would be in their interests for financial surpluses to be invested with a long term perspective.

There is a real basis for cooperation between the developed countries and the OPEC countries, and more generally between producers and consumers. The cooperation is probably conditional on the developed countries adopting vigorous energy policies and making greater efforts to adapt their exports to the long-term development programmes of the petroleum producing countries of the Third World.

. Next come the intermediate countries, where agriculture is still the vital sector but where industrialisation can nonetheless begin. For these countries it is essential to combine :

- assistance for the development of subsistence agriculture ;
- development of modern and appropriate industrial techniques ;
- assistance for the development of domestic energy sources and other mineral resources ;
- financial transfers in the form of long-term loans, project-linker or not as the case may be.

For those countries, conventional aid should be provided essentially as an extra to be used for the development of agriculture and creation of infrastructure.

. Finally, the poorest countries, whose prospects are gloomy, must be enabled to speed up their development and to find individual policies which will ensure some degree of dignity for their populations with low per capita income levels.

The developed countries' strategies should concentrate on increasing and redirecting aid, stabilising certain export earnings, providing assistance to develop food production and eliminating the negative impacts which the developed countries' agricultural policies have on these countries.

Special assistance plans should be worked out for the two main poor areas, Sub-Sahara Africa and South Asia, which should receive almost the entire increase in aid (1) :

- The need for quick action is particularly acute in the case of Sub-Sahara Africa, since the continent is divided into very small countries, many of which are on the verge of viability. With the contribution from the oil-producing Arab countries, three co-operative aid plans could be drawn up for West and Equatorial Africa, East and Central Africa and Southern Africa (naturally excluding the Republic South Africa).
- Because of India's political preponderance, the problem is not the same for South Asia, but the need for specific action programmes exists nonetheless.

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(1) This would be one way of putting into effect the idea of a Marshall Plan for the Third World.

(ii) But the strategies for individual groups of countries must at all times be related to general interdependence between North and South. The report has already mentioned a number of issues which admittedly have North-South elements but really belong in the more general context of world interdependence dealt with in Part V. The following are some of them :

. The influences which different countries may exert on the climate.

. The exploitation of common resources such as the oceans or space.

. Access to raw materials.

. Development of investment in energy and other raw materials.

. The constitution of buffer food stocks and the institution of a food insurance scheme.

. Adjustment of the general rules of international trade and efforts to bring about a general and multilateral reduction of import barriers.

. The enlargement of certain international institutions so that the developing countries most concerned may participate in them.

Then there is one specific subject : systematic analysis by the developed countries of their policies' implications for the Third World.

(c) Framing area policies consistent with overall strategies

On the basis of the common interests of the countries of South and North, it is possible to give a few examples of area policies consistent with the overall strategies that have been outlined.

The study of interdependence has shown that it is almost certainly possible to work out, on the basis of the common interests of the countries concerned in South and North, area policies consistent with the overall strategies that have just been outlined.

. Thus, at global level, any industrial strategy with regard to the Third World should take simultaneous account of technology transfers, financial transfers (direct investment and export credits), rules governing international trade, etc...

. At country-group level, the approach should as far as possible be made consistent through the complementary use of policies for aid, trade and the stabilisation of exports earnings.

Policies of this type would improve the functioning of the international economic system as to equality of opportunity between and within nations, and would even increase the efficiency of the world economy.

The report has mentioned a number of possible policy options which governments might consider to improve the functioning of the international economic system without in any way impairing the efficiency of the world economy. Some of them are undoubtedly controversial. They include measures :

To help the developing countries to exploit their fossil resources and to accede to nuclear energy when their level of consumption warrants it ; to co-operate with them in developing new energy sources ; to see that they take part, if political conditions permit, in any study on oil supplies in case of shortage.

To facilitate the OPEC countries' investments abroad and to give serious consideration to the conditions for their entry into the post-oil era.

To extend export-earnings stabilisation measures to all commodity exports, and improve the measures currently provided for merchanise exports. To lower the developed countries' barriers to imports of processed commodities or raw materials coming from the developing countries and competing with domestic production. To set up machinery to insure investment in the field of raw materials, and good conduct codes for access to national mineral resources.

To take account in the developed countries of the impact that their national agricultural commodity price policies have on the developing countries. To increase food aid. To set up grain buffer stocks.

To work out positive structural adjustment policies in the industrial field. To develop with the industrialised Third World countries exchanges of information on trends in industry. To endeavour to promote a gradual and general lowering of reciprocal barriers in relations with those countries. To avoid measures which would encourage escessively capital-intensive industrialisation in the Third World. To work out codes of good behaviour which would make it possible for multinational enterprises to expand their activities, whilst at the same time protecting the interests of the developed and the developing countries.

To implement active policies on scientific co-operation, development and use of appropriate technologies, and training.

To increase aid. To distribute it differently by geographic area. To integrate it into a general policy towards the country or group of countries concerned. To direct it towards the satisfaction of basic needs. To seek forms of institutions to complement those at present used for its distribution. To facilitate the development of long-term financing. In case of balance-of-payments deficits, to provide for medium-term credits to enable developint countries, where necessary, to restore balance-of-payments equilibrium in better circumstances.

To further, at one and the same time, global netotiations and multilateral or bilateral negotiations at the level of groups of countries. To devise new forms of regional co-operation. To give importance to all forms of non-governmental co-operation. To promote progressively enlarged membership of certain international organisations, while seeking to improve present negotiating procedures.

Naturally, however, North-South policies must be integrated into the wider context of co-operation among all nations.

One of the difficulties for the developed-country governments is that the very large number of interconnected problems raised doubts as to whether governments can bring them all under control : population, food, energy, economic questions, military questions, etc.. Naturally, however, policies on North-South problems must be integrated into the wider context of co-operation between nations, which is the subject of the last part of this report.

PART V : THE GROWTH OF WORLD INTERDEPENDENCE

The trends examined in Parts III and IV are manifestations of a more general phenomenon: the growth of world interdependence.

This interdependence has been accompanied in recent years by great uncertainty.

The need for the developed societies to face changes largely brought about by international forces, and the intensification and diversification of North-South relations are two complementary aspects of international economic development. They are a manifestation of a more general phenomenon: the growth of worldwide interdependence - an interdependence which fuses together the links within and between the North, the East and the South, especially within the OECD area, which is at present the heart of the world's economy. It is an interdependence which goes well beyond the mere economic framework and has political, military, cultural, social and institutional dimensions.

Whence the temptation in some countries to try to reduce the uncertainty by limiting interdependence. Thus, in the present period of transition, the world is confronted with various possible futures.

This interdependence has grown rapidly throughout the last quarter of a century, but in recent years there has been added to it great uncertainty concerning - to take only the economics field - such diverse issues as levels of exchange rates, access to natural resources and oil in particular, the development of exports, etc.. Attitudes have changed accordingly, and there are increasing signs of an understandable temptation on the part of some countries to reduce uncertainty by limiting interdependence, i.e. by choosing a more easily manageable situation even if it is less satisfactory in other respects. There are pressures for protectionism in the developed countries, proposals by developing countries to detach themselves from the international economic system, the desire of some countries producing raw materials to slow down extraction, developed countries wishing to maintain certain strategic activities on their territory, and countries aspiring to life-styles (and consequently price systems) that are incompatible with an economy open to the rest of the world.

Part V considers the major underlying trends...

Part V attempts to answer two series of questions:

. Questions about major underlying trends: How is global interdependence likely to evolve between now and the turn of the century in view of the main national strategies of states? Several replies can be discerned to this first question :

- The gradual decline in the relative weight of the United States in the world economy will result in a steady decline in the power of that country to act as regulator of the world economic system, and in the emergence of a multipolar world. This will be the end of what D. Bell called "American exceptionalism".

- Simultaneously, conflicts of interest could increase among the OECD countries in a number of fields: the monetary system, industrial redeployment, access to sources of energy and raw materials etc.

- There is a long-term trend in certain countries to increase - directly or indirectly - their control over their natural resources, industrial activities and foreign trade.

...and the policies governments can use to strengthen co-operation with each other and to improve procedures for settling disputes.

. Questions about policies: how, in such circumstances, can co-operation between governments be strengthened, procedures for settling disputes be improved, and the development of trade, structural adjustment and supplies of raw materials be ensured, while allowing the partial isolation of those national communities for which the pursuit of their objectives is incompatible with too high a degree of integration in the world economy? What, in such circumstances, can be the role of the international organisations in the management of worldwide interdependence?

This part will deal in turn with:

- *analysis of the scenarios,*
- *prospects for world industry,*
- *sectoral aspects of interdependence,*
- *the management of interdependence.*

Naturally, a central part in these reflections must be given to the analysis of the scenarios, as their purpose is precisely to explore the consequences for the world economy of some basic choices which may be made by national communities. A critical description of the sectoral aspects of interdependence is the logical consequence of this, and it is then possible to tackle the problems of policies as they arise for the developed countries, in terms both of content and of institutional aspects. However, before considering the sectoral aspects, it is necessary to examine the possible future redistribution of industrial activities at world level and to understand the elements of this complex pattern in which both governments and firms are involved. The subject has already appeared twice in this report: as an element in North-South relations, and as an aspect of structural changes in the advanced industrial societies. It must now be treated in its true dimension, the global one, by including in it trade with the East and competition between OECD countries. Why should industrial activity be given this special treatment in the whole subject of interdependence? The answer is simple: the field is an especially complex one, and has had much less study devoted to it than other fields.

1. THE SCENARIOS: POSSIBLE FUTURES

This time has now come to present the scenarios successively. They are arranged in four groups:

- *the high-growth scenario(1),*
- *the moderate-growth scenarios(B1, B2, B3),*
- *the North-South confrontation scenario(C),*
- *the protectionist scenario(D).*

Once the sectoral aspects have been studied, the discontinuities which may arise on the basis of the scenarios will be dealt with.

Whether we have been discussing the possibilities of growth in the advanced industrial societies, analysing North-South interdependence, or describing structural changes in a few branches of industry, the scenarios introduced in Part II of this report have always been somewhere in the background. This is not surprising, as the scenarios are an attempt to indicate the influence the "choices of society" and the choices of international relationships made by the large groups of nations will have on the development of the world economy.

The time has now come to make a synthesis, and with it, to present the scenarios successively(1). They are placed in four groups, and the order of presentation implies neither a value judgement nor any decreasing or increasing order of plausibility. After the high-growth scenario in the advanced industrial societies (Scenario A), we shall take together the moderate-growth scenarios (Scenarios B1, B2, B3), then the North-South confrontation scenario (Scenario C) and the protectionist scenario (Scenario D). It is only after studying the sectoral aspects of interdependence leading up to a discussion of the policy issues that we shall be able to touch on the possibility of other scenarios, such as those involving geopolitical ruptures. Thereafter we can consider the important question of what would be the most likely sequence of events in the absence of vigorous action by the governments of the OECD countries.

Depending on the model used in constructing the numerical framework of the scenarios(2), the descriptions refer to regional groupings, sectoral breakdowns or, more generally, parameters summarising certain assumptions about the world economy. To make it easier to read the text without complicating the presentation, the main information needed to understand it has been grouped in Table 44.

For each scenario, the development of the discussion is in principle the same: What calculations have been made to reflect the propositions forming the basis of the scenario? What macroeconomic picture do they lead to? What will the sectoral trends be? What difficulties might prevent the fulfilment of the scenario, and what problems remain?

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(1) Presenting the scenarios one after the other has the advantage of bringing out the consistencies and tensions peculiar to each scenario. But it makes comparisons difficult. The tables have therefore been brought together at the end of the section to enable readers to compare the orders of magnitudes given by the main scenarios. A recapitulatory table of scenarios A, B2, C and D is given in Part II, p. 89.

(2) In particular SARUM, the model developed by the Department of the Environment in the United Kingdom.

Table 44

Some technical points useful for understanding the scenarios

Some of the assumptions in the scenarios can be expressed numerically: for instance, rates of change in the labour force, participation rates and productivity. The figures for these are taken from government studies or are INTERFUTURES estimates. They make it possible to calculate the parameters (in particular, the projections of growth rates to be used as inputs for the SARU model, which INTERFUTURES has used to ensure the consistency of the whole and simulate the long-term changes in inter-sectoral and inter-regional relations.

1. THE CHARACTERISTIC FEATURES OF SARUM

This model was developed by the Systems Analysis Research Unit (SARU) of the United Kingdom Department of the Environment. It functions essentially through changes in demand and prices and explicitly takes into account scarcities of resources in the agriculture and energy sectors. Some changes have been made in the model by the SARU at the request of INTERFUTURES. They consist of a new regional breakdown, changes in the coverage of the sectors (see below), and changes in certain macro-economic mechanisms. The model was constructed on the assumption that many aspects of the world economy can be described in neo-classical terms. Productive activities are assumed to be carried on by entrepreneurs minimising costs, and decisions as to consumption and savings are taken by individuals maximising utility. Production processes are represented by Cobb-Doublas production functions with technical progress as an exogenous factor.

Where international trade is involved, however, there are tariff and non-tariff barriers. These are introduced into the model in the form of "bilateral trade biasses" matrices which are applied in the determination of trade flows. The bias takes the form of notional increases in the prices of traded goods. They are fixed initially so that the trade observed in about 1970 is reconciled with that which would have taken place with the observed price differentials in a free market. By increasing or reducing these trade biases it is possible to simulate increases or decreases in trade barriers.

Table 44(continued)

2. REGIONAL BREAKDOWN

1. *NORTH AMERICA* (Region 1)

   Canada, United States

2. *JAPAN* (Region 2)

3. *EUROPEAN ECONOMIC COMMUNITY* (Region 5)

   Belgium, Denmark, France, Germany (Federal Republic), Ireland, Italy, Luxembourg, Netherlands, United Kingdom

4. *OTHER WEST EUROPEAN COUNTRIES* (Region 6)

   Austria, Cyprus, Finland, Greece, Iceland, Malta, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, Yugoslavia

5. *OCEANIA AND SOUTH AFRICA* (Region 3)(1)

   Australia, Fiji Islands, Gilbert and Ellice Islands, Guam, New Caledonia, New Hebrides, New Zealand, Pacific Islands under mandate, French Polynesia, American Samoa, Western Samoa, Solomon Islands, South Africa, Tonga, Papua New Guinea

6. *USSR AND EAST EUROPE* (Region 4)

   Albania, Bulgaria, Czechoslovakia, Germany (Democratic Republic), Hungary, Mongolia, Poland, Rumania, USSR

7. *LATIN AMERICA* (Region 7)

   Argentina, Belize, Bolivia, Brazil, Caribbean, (other nations and territories), Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Guatemala, Guyana, French Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, El Salvador, Surinam, Trinidad and Tobago, Uruguay, Venezuela

8. *SOUTH ASIA* (Region 8)

   Afghanistan, Bangladesh, Bhutan, Brunei, Burma, India, Macao, Maldive Islands, Nepal, Pakistan, Sri Lanka

(1) Since this region is particularly heterogeneous, INTERFUTURES has tried in its analyses to isolate the Australia-New-Zealand group.

Table 44(continued)

9. *EAST AND SOUTH EAST ASIA* (Region 9)

Hong Kong, Indonesia, Kampuchea, Korean Democratic Republic, Korea Laos, Malaysia, Philippines, Singapore, Taiwan, Thailand, Vietnam

10. *CHINA* (Region 10)

11. *WEST ASIA AND NORTH AFRICA* (Region 11)

Algeria, United Arab Emirates, Bahrain, Egypt, Iran, Iraq, Israel, Jordon, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, Yemen(Aden), Yemen(Sana).

12. *SUBSAHARAN AFRICA* (Region 12)

All African countries except those in Regions 3 and 11

3. SECTORAL BREAKDOWN

	Sector	SITC code for trade flows
1.	Capital equipment	Section 7, excluding passenger cars
2.	Construction	No trade
3.	Other manufactures	Sections 5-9, less capital goods and chemicals for agriculture plus some products from Sections 0-4
4.	Primary energy	Section 3, excluding refined petroleum products
5.	Ore extraction	Divisions 27 and 28
6.	Other natural products of biological origin	Sections 1-4, with some exceptions
7.	Services	
8.	Food production of agricultural origin	Section 0, excluding beverages (07)
9.	Development of arable land	
10.	Irrigation	
11.	Fertilizers and other chemicals for agriculture	Mainly Division 56

High growth in the advanced industrial societies (Scenario A)?

This scenario, which assumes in particular steady economic growth in the developed countries, convergence of their productivities, liberalisation of trade with further integration of developing countries into the world economy, and large transfers of resources to the poorest countries, encounters both internal obstacles in the developed countries and external obstacles (availability of energy and international economic constraints).

What difficulties does this scenario encounter? We already know most of them: internal obstacles in the developed countries arising from overall demand management and from conflicts between rigidity and pressures for structural change; international obstacles arising out of energy availability or the constraints imposed on each country by the behaviour of the others. We now have to understand these in a more comprehensive fashion, and also identify the problems which are left unsolved by the fulfilment of the scenario, in order to be able to assess its probability and desirability later on.

What, then, does the first scenario (Scenario A) assume?

- a resumption of steady economic growth in the developed countries without any rapid change in values;

- continuous progress towards greater economic homogeneity between the main poles of OECD, which particularly appears in the form of productivity trends that converge (in terms of levels and rates of growth) on the long-term, exogenously determined trend of productivity in the United States;

- collaboration on a more equal footing between these main centres in managing their interdependence, and increased liberalisation of their trade;

- an opening up of economic relations with the developing countries and the gradual integration of the latter in the world market. Taking into account the heterogeneous nature of the Third World, this opening up does not exclude the establishment of differentiated relationships that reflect better the varying abilities of countries to industrialise, and their internal constraints on development. It also assumes a substantial increase in aid and transfers of technology, and liberalisation for the manufactures exported by the developing countries.

This scenario is therefore not a mere continuation (or resurrection) of the "pre-1974 world" since it assumes that in order to make possible high growth (or resurrection) in a transformed environment, active and new policies will be pursued by the developed countries in organising their relationships with each other and with the developing countries.

A brief description of the assumptions about growth rates, energy policies, liberalisation, and aid and financing

The growth path of the OECD countries is the result of a calculation which assumes simultaneously:

. The making good of losses in production and/or productivity due to the recession. This catch-up takes place by 1990, the date on which unemployment is assumed to be reduced to its full employment component(1).

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(1) As estimated in the work of Working Party N° 2 of the OECD Economic Policy Committee.

conclude the introductory presentation of the scenario.

. The continuation of US long-term productivity growth at the annual rate of 1.84 % assumed by the Council of Economic Advisers (1977), with a catching up to offset the shortfalls in the trend recorded during the last recession(1). This US productivity trend is thus exogenously determined.

. Convergence of the productivity trends of the various countries on the long-term trend in the United States(2).

. Changes in population and participation rates determined exogenously by extrapolation of recent trends.

The calculation process, which is the same for all countries, may naturally result in more or less realistic figures depending on the country, but so far as the main economic centres are concerned, this does not affect the significance of the scenario (Tables 24, p.121 and 45, p.306).

The growth figures for the developing countries over the period 1975-2000 incorporate the effects of the other assumptions in the scenario. They are based on the work of INTERFUTURES (but for the period up to 1985 account has been taken of the estimates given by the World Bank of the growth elasticities of development regions compared with the growth of the developed countries): 7 % for Latin America, 5 % for South Asia, 7 % for South-East Asia, 7 % for North Africa and the Middle East, and 5.2 % for Sub-saharan Africa.

Lastly, for the Eastern countries and for China, the rates of growth from 1975-2000 (5 % and 6 % respectively) are based in the first case on the forecasts of the United Nations Economic Commission for Europe, and in the second, on internal INTERFUTURES studies.

There are three other sets of supplementary assumptions:

. To make energy constraints more flexible, all countries adopt conservation policies which make it possible, in the period 1975 to 2000, gradually to reduce the elasticity of demand for energy from 0.8 to 0.6 in the developed countries, and from 1.4 to 1. in the developing countries.

. Liberalisation of trade, an essential element in the logic of the scenario, takes the form of a twofold reduction:

- a regular reduction (3 % annually) in the trade bias for imports by the developing countries of manufactures (excluding capital goods) from developed countries;

- regular and more rapid reduction (5 % annually) in the trade bias for all other flows of manufactures (including capital goods).

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(1) Productivity per person employed per year.

(2) The convergence calculations are based on 1970 prices and rates of exchange. While inflation differentials and parity changes clearly give rise to imperfections in international comparisons of productivity, these disparities linked to different base years do not affect the logic peculiar to the scenario (see Part II).

On the other hand, to encourage growth of agricultural production in South Asia and Sub-saharan Africa, the trade bias for food imports by those regions increases slightly (3 % annually) until 1985.

. The assumptions about trade and growth rates define, for the Third World regions, their external financing requirements. In this scenario, aid from the developed countries is an important element of this financing. Normatively, for each developed region, this aid is assumed to increase to 0.7 % of GDP by 1990 and 1.0 % by 2000. Its allocation depends on an index reflecting population and per capita income, and also external deficits before capital transfers. Supplementary assumptions have been introduced concerning direct investment and loans.

In this scenario, the distribution of world income by regions changes substantially by the year 2000. Per capita incomes almost double, but their geographical distribution only changes slowly. The increase in productive investment plays a major role.

The final macro-economic picture? This has already been outlined (see Part II, table 21): over the 25-year period world production increases 3.4 times, and per capita income 2.3 times. The shares of the main regions in world GDP change considerably /from 31.4 to 21% for North America, from 18.5 to 16% for the EEC, from 6.8 to 10% for Japan, and from 21.6 to 31% for the Third World (including China), the share of the East European countries remaining stationary at approximately 16%/. With an income per head of the order of 10,000 1970 US dollars (1), North America and Japan are ahead of the EEC (at $9,000) and East Europe which is in the region of $8,000, at the other extreme, Sub-Saharan Africa and South Asia are still very poor areas, with 380 and 210 dollars per capita respectively. The regional distribution of per capita incomes is not fundamentally changed from the present situation: in 1975, the OECD countries, with 20% of the world's population, produced 66% of its income; in the year 2000, the figures are 16% and 53% respectively.

Increases in productive investment undeniably play a major part in this scenario. In the developed countries, the tendency for capita output ratios to increase is generally not fully offset by the trend of industrial structures, resulting in a relative growth of the sectors that are less capital-intensive than the average, such as the capital goods sector. In fact, investment in energy and in anti-pollution devices, and more capital-intensive services, are tending to offset the previous trend. In the developing countries, the scenario implicitly assumes that there will be no growth in capital-output ratios as industrialisation proceeds and productivity rises(2).

The picture presented by the scenario, consistent with the growth assumptions, is the following:

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(1) Unless stated otherwise, the US values given in this sector are at constant 1970 prices and exchange rates.

(2) Except in countries that have a surplus of capital and are undertaking very capital-intensive industrial projects: the oil-exporting countries for example.

- In North America there is a slight increase in the share of investment in GDP.

- The trend is similar but more marked in the EEC following the effects to catch up on productivity.

- For Japan the problem is posed in other terms: the initial ratio of investment to GDP being very high (33.6 %), the scenario following its own logic assumes a fall in the ratio of investment, in accordance with the assumption of a gradual progress towards homogeneity in production (and consumption) structures. This point well illustrates a characteristic feature of past Japanese growth which, under the constraint of external equilibrium, was only able to increase its productivity and change its industrial structure with the help of a high level of investment.

- In the developing countries, the higher ratio of investment to GDP reflects more intensive capital accumulation domestically as well as increased capital flows from abroad(foreign aid and investment).It must be noted however - and this is confirmed by recent World Bank estimates based on growth assumptions comparable to those of the scenario - that the differences in domestic investment rates between developing countries tend on the whole to widen in the framework of this scenario. In regions of relatively low growth such as South Asia and Sub-saharan Africa, capital flows in the form of foreign aid, loans or investment are absolutely essential to maintain even moderate levels of overall investment.

What are the sectoral dimensions of the scenario as regards energy, agriculture, industry, trade and financial flows?

The sociopolitical reality of energy problems may prevent the realisation of the scenario.

(i) For energy the orders of magnitude are already known: world consumption of 15.3 MMTOE would be quite probable in a high growth situation. Only the strictest conservation policies could gradually reduce elasticities to the levels chosen (0.6 for the developed countries and 1.0 for the developed countries), and bring consumption down to something approaching 14.6 MMTOE (table 46).

However, even the latter requirement cannot be covered if investment in oil research and extraction is insufficient, if coal production is not drastically increased, if security problems or the reactions of certain sections of public opinion hold back the development of nuclear energy. Rather than physical limits it is therefore the sociopolitical reality of energy problems which may prevent the realisation of the scenario.

The scenario results in high growth of food production in the Third World at rates similar to the targets of the UN

(ii) Agriculture. The picture given by scenario A can only be understood by reference to certain assumptions about the future that are used in SARUM and are common to all the scenarios. These include: arable land losses from erosion or urbanisation do not exceed certain limits; annual and season variations in temperature and rainfall are of the same order as those observed over the last fifty years; the

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Second Development Decade.

There is no guarantee that these rates can be achieved. They would still leave large numbers suffering from malnutrition because of inequitable income distribution. The scenario would produce fundamental changes in trade in food products, and a redeployment of the agricultural machinery sector.

increase in the use of fertilizers and pesticides does not lead to serious pollution of the environment(1); a gradual slowdown in technical innovation in the OECD countries, but a speeding-up in the Third World; the disappearance of past distortions in regard to agriculture in most of the developing countries; an improvement in the agricultural situation in the USSR and the Eastern countries(2).

It is in scenario A that world food production is the largest, but the difference from one scenario to another is never more than 10 %. On the other hand, the regional distribution of that production depends very much on the scenario.

In OECD countries, the limited growth of population, changes in age structures, low income elasticities of demand for many agricultural products and increased awareness of the health risks associated with certain food consumption patterns, combine to strengthen the qualitative and quantitative saturation of demand that has been emerging for the last 10 years. Further liberalisation of trade also limits the expansion of output: the OECD countries, in order to strengthen their high technology sectors, reduce the barriers to imports of agricultural products from other OECD countries and the Third World. They also help the Third World to increase its agricultural productivity and output.

In all regions except for Japan, food production grows faster than the population, though the rates for OECD are below those for the period 1961-1975. Compared with the prices of other goods and services, the farm prices of food do not rise significantly in most OECD countries. Those of the EEC remain well above world prices. Only Japan, with little arable land or water power to develop, and low marginal returns to fertilizers, experiences a sharp rise in production costs and accordingly imports more. Its rate of self-sufficiency falls by 30 % between 1970 and 2000 and is about 50 % at the end of the century. At the same time, Japan reduces its relative dependence on North America and increases its imports from Latin America, Australia and New Zealand. Admittedly such a reduction in self-sufficiency is unrealistic in the short run, but it is realistic in the long term in the logic of a scenario in which Japan increases its exports of manufactures.

In both developed and developing countries, the increase in food production is mainly due to higher yields. The area devoted to food production is slightly reduced in the OECD area, while there are substantial increases in Latin America and Africa. In Asia a slight increase in area in China is offset by reductions in many South, South-East and East-Asian countries. These reductions are due to poor soil husbandry or to industrial and urban development.

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(1) There exist in the OECD countries technical possibilities and policy instruments which could prevent it; for the developing countries application rates will be lower and will not generally give rise to problems up to the end of the century.

(2) The USSR continues to develop its irrigated areas and its cereal storage capacity. It becomes self-sufficient in cereal production.

Third World countries possessing significant water and cultivable land resources and high marginal returns to fertilizers, push ahead with their food production and reduce their dependence on imports. This expansion is facilitated by the adoption of strategies designed to meet basic needs in South Asia, Sub-saharan Africa, and to a smaller degree in Latin America. In the Middle East, North Africa and East Asia, on the other hand, comparative advantages in other fields moderate the growth in food production. The scenario growth rates for the first group of regions are singificantly higher than the rates observed in 1961 to 1975, ranging from 4.0 to 4.4 % per annum for the period 1970-2000. They are close to the UN Second Development Decade targets, recently reaffirmed by the Committee of the whole, which average 4 % per annum. Most developing countries are unlikely to be able to introduce changes in institutions, infrastructures and technologies rapidly enough to achieve such rates. However, even an expansion such as that would not eliminate malnutrition, because of the inequality in income distribution: 10 % of the population of Asia and 25 % of that of Sub-saharan Africa could still suffer from malnutrition at the end of the century, and considerably more may be undernourished.

In this scenario, the structure of world trade in agricultural raw materials changes considerably between now and the end of the century, with a 25 % fall in OECD's share, a 50 % fall in the share of the centrally-planned economies, and a twofold increase in the share of the Third World. Trade between the main poles of OECD is reduced, while that between the main developing regions is intensified. In the medium term, the improvements in agricultural productivity in the USSR and Eastern Europe are too slow to prevent increased dependence on OECD, but do not reach strategically significant levels, whereas, in the longer term, the trend is for internal supply and demand to balance and for imports to return to the 1970 orders of magnitude.

Net OECD food imports from the Third World(1) rise from approximately 500 million 1970 US dollars in 1975 to between 4 and 10 billion dollars in the year 2000, the value depending on assumptions concerning the rate of transfer of certain production and processing activities from the OECD to the Third World. North America, Australia and New Zealand substantially increase their commercial exports to North Africa, the Middle and Far East, but those to Sub-saharan Africa and South Asia expand less, as these regions become more self-sufficient in terms of effective demand.

According to the assumptions of the scenario, China is capable of meeting its domestic demand for cereals and most food products. Thus its grain purchases on the world market should not exceed the levels observed since the end of the 1960s. However, the model simulations and other studies suggest that China might be unable to meet demand for food products such as sugar, or certain industrial raw materials such as cotton, and might be obliged to acquire substantial quantities of these on the world market.

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(1) SITC 0, beverages excluded

In this scenario, the impact of possible rises in the price of energy on food production costs is not highly significant. Food consumer prices move even further away from production prices. Faced with increasingly saturated markets in the developed countries, the food industry puts greater emphasis on the introduction of non-farm ingredients, preparation, packaging and publicity. The proportion of the retail price accounted for by farm production prices may commonly fall below that of packaging and publicity. Furthermore, in this scenario energy utilisation increases, the nutritional value declines and the sensitivity of food prices to inflation is augmented.

The combination of low growth in agricultural output in OECD and high growth in the Third World has an obvious impact on the agricultural machinery sector. The OECD becomes mainly a replacement market, and OECD agricultural machinery producers meet increased competition in the Third World markets from producers based in the developing countries. The multinationals transfer an increasing proportion of their production to the Third World and the corresponding work forces is greatly reduced in the OECD countries.

In scenario A the liberalisation of trade helps industrial expansion in the Third World while keeping growth rates relatively high in the developed countries, but only on condition that the latter push through the structural adjustment of their industry.

(iii) The industrial dimension. The introduction of new forms of international division of labour in this scenario may be considered as a means of solving the problems of structural ajustment facing the developed countries, while permitting sustained industrial growth - though with enormous quantitative and qualitative differences - in the developing regions.

Increased liberalisation of international trade helps the industrial expansion of the Third World. Whether they shift productive activity abroad or create new capacity in the process of fragmentation of production which we have mentioned earlier, the multinational firms, together with governmental or quasi-governmental agencies in the developing countries, are some of the main motive forces of that expansion.

At the same time, liberalisation of trade helps to maintain comparatively high rates of growth in the developed countries. The gains from trade, and the profits resulting from the internationalisation of production facilitate the process of restructuring the production systems of the developed countries around new generations of capital and consumer goods. The development of these capital goods then leads, by its effect on production processes, to substantial productivity gains in the developed countries.

On the other hand, there may be wide differences between advanced countries as to the potential gains and losses resulting from their liberalisation of trade with the developing countries. Affected by both the competition of the developing countries and the technological advance of the more developed countries, some OECD countries may encounter serious difficulties in restructuring their industrial activity towards the production of capital goods. The scenario thus fully reveals the problem of the need for concerted action between the developed countries as regards structural adjustment policies.

The question of which activities can expand in the various developing countries will depend very largely on their ability to establish or strengthen the industrial base needed for the domestic accumulation of capital. While an increasing number of them will develop export-oriented industries, only a few will succeed, mainly by gradually building up a capital goods industry, in strengthening the domestic base for their export industries and in filling the gap between export promotion and the production of industrial goods for mass consumption on the domestic market.

In this scenario, the annual rate of growth of world industrial production is likely to be lower between now and the end of the century than during the 1960s, that is, about 5 % annually. A slower rate of growth in the developed countries, and an increase in the proportion of services in their national production, are the main reasons for this. The rate of 5 % is incidentally achieved only by a higher sustained rate of growth of production of investment goods (approximately 5.4 %).

The changes in the worldwide distribution of production of manufactures (machinery and other goods) have already been described in Part IV (and further details are given in table 48). The salient points may be summarised as follows:

- The United States' share of world production of machinery and other manufactures declines significantly from 31.1 % and 30.4 % in 1970 to 18.7 % and 17.2 % respectively in the year 2000.

- On the other hand the shares of Japan in these two sectors increase by approximately 3 % to 13.5 % and 8.4 %.

- The shares of Europe decline, though relatively less than those of the United States. At the end of the century the total value added for the machinery (capital goods) industry of the present EEC countries is likely to be higher and that of other manufactures may remain slightly lower than that of the United States.

- The shares of the East European countries increase slightly and may be of the order of 21 % of world production for both the sectors.

- The share of the Third World, excluding China, in world industrial production would be approximately 18 % with, naturally, a lower percentage for machinery alone (of the order of 13 %). As an order of magnitude, industrial production in this group of countries would be the same at the end of the century as that of the OECD countries in 1975, with Latin America probably contributing more than one-half.

Big changes occur in international trade patterns, both as regards the kinds

(iv) The rapid growth of international trade in this scenario (slightly more than 7 % annually) is not surprising : it is a high figure considering the aggregation of the world into 12 regions, but is a logical consequence of the scenario's assumptions on growth and trade *of products traded and the shares of the various regions.*

liberalisation. On the other hand it is a figure which must not be allowed to conceal the changes in the structure of trade, in particular:

. The qualitative and quantitative pattern is projected to change with a slowing down in trade in oil products which is accentuated in the 90s; slowdown in trade in food products; growth in capital goods exports from OECD countries; growth in exports of manufactures from the developing countries (9.5 % per annum).

. The regional shares alter for manufactures for example: a decline in the share of OECD countries' exports (less marked for capital goods); increases in the shares of the Eastern and Third World countries; a marked increase in the trade between the developing regions (of the order of 13 % annually), although its share still does not go beyond 6 % of total world trade. At the end of the century, trade between OECD countries amounts to no more than 41 % of world trade in manufactures (tables 50 and 51).

(v) Let us conclude this rapid sectoral survey with capital flows: the relatively high economic growth rates chosen for the Third World as a whole imply a continuous need in their external financing requirements:

- Direct investment and debt constitute an increasingly large part of the external financing of the industrialising countries. The debts of these countries increase until the 1990s, then decline in relation to foreign investment. In the absence of guarantee machinery, the 1980s might prove to be critical.

- At the same time, an increase in the volume of official aid is made necessary in the first part of the period by the persistence of trade deficits, but the gradual reduction of those deficits in some regions makes it possible to redirect such aid towards Sub-saharan Africa and South Asia. On the assumption of aid equal to one per cent of the income of the developed countries, these two regions might be receiving 70 1978 US $ per head in aid by the end of the century - more than that received by the European countries during the Marshall Plan or South Korea after the Korean war. The cumulative total of aid by the year 2000 would greatly exceed that of the Marshall Plan. Assuming that 30 % of the aid goes to agriculture, 20 % to industry and the remainder to infrastructural development, such flows would probably raise the growth rates indicated for those regions by one percentage point from 1990 onwards, but the major effects would not be felt until after the turn of the century. They might be considerable.

For this scenario to be realised many obstacles have to be overcome by the developed countries:

The realisation of this scenario assumes that many obstacles are overcome. For the developed countries, the internal and international aspects of those obstacles are closely intermingled:

. Internally, it would seem that two interdependent conditions would have to be fulfilled:

- sustained recovery in investment in the developed countries;

- acceptance by them of structural adjustments;

- concerted action in the management of overall demand;

- liberalisation of trade;

- massive increase in financial flows for the Third World;

- adoption of vigorous energy policies.

But the scenario also presupposes action by the developing countries.

- Sustained and regular recovery in investment. What does this require? Control by governments over conflicting calls on the apportionment of the national output between trade consumption, non-trade consumption and savings. Reduction of the doubts about profitability arising both from uncertainties in the international situation (fluctuations in exchange rates, availability of energy), and the future apportionment of value added between wages, tax and other deductions, and profits. This is another way of saying how difficult overall demand management is bound to be.

- The acceptance of continuous structural adjustment, and consequently the introduction of policies which make this socially acceptable. Greater flexibility in the labour market to facilitate employment and transfers of manpower from one activity to another, maintenance of a balance between the welfare state and the market, rejection of protectionist policies, vigorous action to conserve energy - these are simply different aspects of the active control of change by governments.

. But four conditions must be simultaneously fulfilled at the international level:

- determined and concerted action by the main industrial countries in the management of overall demand, to stabilise exchange rates, reduce balance of payments desequilibria and reduce the foreign trade constraint for many developed countries;

- general and ongoing policies of trade liberalisation. In the scenario liberalisation is a pre-condition, not only for the integration of the developing countries, but also for the sustained growth of the industrial countries, insofar as the expansion of their exports to the Third World offsets the growing penetration of their markets. If this liberalisation is not accompanied by positive structural adjustment policies it could impose socially unacceptable changes on certain countries which would end the movement towards more open trade;

- a massive increase in financial flows in regard to the Third World, with a significant increase in aid to the poorest countries, whose problems cannot be resolved by the expansion of international trade. More generally, a large increase in financial flows to the Third World;

- awareness by governments of their responsibility in energy matters, and of the need for simultaneous policies of conservation and development of alternative sources as substitutes for oil.

Underlying these economic conditions, however, the scenario poses political problems about which it is impossible to avoid asking questions:

. The relative overall economic power of the United States is falling significantly. This relative decline, which reflects both the development of the rest of the world and the difficulties peculiar to the American society, is accompanied by considerable specific advantages of increasing importance: a technological lead in key sectors such as industrial electronics, and an abundance of agricultural, energy and mineral resources (not to speak of military factors). Although the USA is still the world's main economic power, its global position has ceased to be exceptional and because of the above duality it will not be easy for the United States, with the help of its partners, to find the way to cohesion and collaboration on a more equal footing within the developed world.

. The rapid growth of Japan, which is largely the result of a better adjustment of its social organisation to a world in which national and international interdependence are increasing, may be the reason why Japan is such a keen competitor, since its lack of natural resources makes its economy dependent on increased exports whenever the prices of imported raw materials rise. This leads to a risk of intensified conflict, in the trade field in particular, in the event of an energy shortage.

. The main question concerning the EEC - enlarged or not - is its cohesion. Because of the differences in the production structures of its members, overall trade liberalisation undoubtedly implies the introduction of intra-European policies designed to share the aims and costs of that liberalisation more or less equitably.

. The scenario assumes participation by Third World countries in three ways: the strategy of the OPEC countries determines, through investment in prospecting and extraction, the development of their oil production capacities and through pricing policies, the regularity of increases in energy costs. Some countries in the process of industrialisation, in Latin America in particular, may prefer limited and assymetrical advantages for their exports rather than trade liberalisation, and thus compromise the general opening-up of international trade. Finally, for many developing countries, the expansion of food production necessitates the progressive elimination of distortions unfavourable to agriculture.

. Lastly there is the problem that at the end of the century, poverty will still be prevalent in two large areas, Sub-saharan Africa and South Asia. Large-scale aid might increase their growth beyond the estimates of the scenario, but will the developed societies wish or be able to undertake this? In terms of Realpolitik, it is not easy, in the comparatively short period of a quarter of a century, to assess the weight of this part of the Third World in the worldwide political balance. In the long run, however, the continuation of extreme inequalities can only be a factor leading to tension.

The advanced industrial societies and the range of moderate growth rates (Scenario B)

It is interesting to discuss in parallel the three scenarios for moderate growth: that for new growth, and those for moderate converging and moderate diverging growth. The discussion begins by presenting the assumptions underlying the projections.

Three scenarios explore the assumption of continuing slow growth in the developed countries. They all assume that efforts to liberalise will continue, especially between the advanced and the developing countries, in an overall context excluding confrontations within the Northern group and in North-South relations. But they differ profoundly in their implications.

Scenario B1, as we know, is based on a rapid change in values affecting modes of consumption, organisation of work and structures of production. The slower growth in national income is here the result of a consensus about the new values.

In Scenarios B2 and B3, however, the values system is not basically changed, and it is a twofold social fragmentation within the developed countries which holds back structural adjustments. Slower growth is the consequence of the failure to make the structural adjustments necessary to attain a high growth target.

The hypothesis of a long-term convergence in the levels of productivity of the OECD countries is maintained in Scenarios B1 and B2, whereas Scenario B3 is designed to evaluate the possible consequences of a divergence in productivities in a context of slower overall growth.

Part III has already brought to light some of the problems raised by these scenarios: in many OECD countries, the re-emergence of a consensus about renewed growth is still hypothetical. As for the other moderate growth scenarios, they contain the seeds of a twofold instability, by the dissatisfaction they generate at national level and by the temptation they provoke to introduce a neo-protectionism internationally.

The description begins with Scenario B2 for reasons of ease of presentation, no judgement as to its value or probability being implied.

For the OECD countries, the course followed by "converging moderate growth" (Scenario B2) is determined on the basis of the following four assumptions:

. There is no catching up of the productivity losses incurred as a result of the recession. Unemployment continues to contain a structural component, and in 1990 is at a level midway between the present level and that of Scenario A.

. Long-term productivity in the United States grows at an annual rate of 1.50 %, i.e. the same as from 1964 to 1973; this rate is 20 % lower than that for Scenario A; it is an exogenous factor.

. The productivities of the other OECD countries gradually converge on that of the United States, but the time taken to do so is longer than in the high growth scenario.

. Populations and participation rates are the same as in Scenario A.

These assumptions give rise to the estimates in Tables 21 and 46 . The growth rate for OECD as a whole, from 1975 to 2000, is 3.4 % per annum.

In this scenario unemployment is reduced compared to its present level, but the reduction does not prevent the continued presence of structural unemployment trhoughout the whole of the period. Several factors contribute to this reduction: a growth which is moderate, of course, but for the majority of countries somewhat more sustained than in recent years; a demographic trend which limits the increase in the labour force; a gradual adaptation of the labour market to the moderate growth situation; a probable increase in the numbers of public sector jobs.

To simplify the analysis, GDP growth rates are assumed to be the same as in the new growth scenario (B1). However, this apparent similarity hides a number of quite different assumptions:

. Different trade-offs between work and leisure lead to a reduction in hours worked; adaptations in life-styles and changes in values vis-à-vis employment affect labour force participation rates; later entry on to the labour market, training throughout the whole of working life, successive periods of work and non-work in connection with the informal sector and the "third system",all tend to reduce the participation rate, whereas improved working conditions might tend to increase it. All in all, it was concluded that the overall effect of all these factors would be a progressive reduction of 25 % of the number of hours of work supplied per year compared with scenarios A and B2.

. As regards hourly productivity per person employed, Scenario B1 uses the same growth rate as Scenario A. Several factors may justify this assumption; an organisation of work more in harmony with the motivations of the labour force; an increase in the expected return on capital as a result of less social fragmentation and less uncertainty, giving a more favourable investment rate than in Scenario B2.

. The above assumptions make it possible to calculate national unemployment rates somewhere between those of Scenarios A and B2. This is plausible, since the lesser importance accorded to income and the increased importance attached to the maintenance of the physical and human environment make job-sectors less active when they are unemployed and less keen to change their place of employment.

Lastly, in the scenario of diverging moderate growth, exogenous assumptions have been made for productivity growth in the main economic poles (Table 45). With the year 2000 as the horizon, the differences may seem slight; however, they contain the seeds of significant differences in the 21st century in that, while Japan easily overtakes

American productivity, the growth of European productivity becomes slower and slower(1).

Table 45

Scenario B3:

Annual rate of growth of productivity and GDP for the United States, Japan and the EEC in % (1975-2000)

	Productivity	GDP
United States	1.5	2.4
Japan	5.9	6.6
EEC	2.9	3.2

The developing regions are affected differently by the slowdown in growth in the OECD because of the nature of their economies and their links with the North:

. In Scenario B2 the growth assumptions are primarily based on the elasticity of regional incomes in the South in relation to income in the OECD: This gives: 6.5 % for Latin America, 3.9 % for South Asia, 6.4 % for South-East Asia, 6.0 % for North Africa and the Middle East, and 4.3 % for Sub-saharan Africa.

. Less obvious are the assumptions to be adopted in the case of Scenario B1, since the new values, which include both less interest in material goods and a greater emphasis on other aspects of the quality of life, might give rise to a certain indifference in the developed countries to the Third World. The approach decided on for Scenario B1 is quite different. It assumes that the desire to open up to the world overrides renewed conservatism, and that the economic and social transformations in the developed countries lead to a change in North-South economic relations. In these circumstances, the new growth would slow down growth in the OEPC countries and the industrialising countries but the constraints on their exports might facilitate the development of the poorest areas (Sub-saharan Africa and South Asia), thanks in particular to the extension of aid. Nevertheless, the growth rates for the various regions of the Third World have not been precisely specified in this scenario, since changes in the pattern of flows would make any estimates illusory.

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(1) It might be asked why INTERFUTURES has introduced scenario B3 since it plays an apparently minor role in the discussion which follows. In fact, this scenario is important for two reasons:

- It leads one to ask questions about the long-term determinants of productivity which lie outside the present range of productivities.
- It encourages reflection concerning the emergence in the 21st century of a highly developed economic area in the Western area of the Pacific.

By comparison with Scenario A, there is no change in China's growth rate and that of Eastern Europe is barely reduced- from 5 to 4.8 %.

As far as the supplementary assumptions are concerned, they follow from the logic of the scenarios:

. The elasticities of demand for energy used in the strong growth situation are retained in Scenarios B2 and B3 in order to bring out more clearly the slowdown in growth. On the other hand, the opposition encountered by nuclear energy because of the change in values in Scenario B1 obliges governments to adopt even stricter conservation measures: from the current value of 0.8 or above, the elasticity falls to 0.6 in 1985 and 0.5 in the year 2000.

. The degree of trade liberalisation in Scenarios B2 and B3 is identical to that in Scenario A. In the new growth Scenario B1, on the other hand, the OECD countries co-operate with the developing countries to increase their food self-sufficiency and to facilitate the expansion of trade inside the Third-World.

. In scenarios B2 and B3, budgetary difficulties in the developed countries and public opinion reactions make it impossible to increase the proportion of official development assistance. For the OECD area it remains at the current national average level of .31% GNP. Balance of payments equilibrium in the Third World is achieved mainly by resorting to foreign loans and investment. However, in the case of the new growth scenario (B1), it was considered feasible to assume that the percentage of aid could reach the levels achieved in Scenario A, thereby reducing the relative size of debt and direct investment.

While the macro-economic pictures provided by the moderate growth scenarios are very similar, the sectoral descriptions make it possible to see how profound the differences are.

At the level of national incomes, the final images given by Scenarios B1 and B2 are very similar, although it is a superficial resemblance and they have different impacts on the Third World. Initially, as a first approximation, let us consider them together:

. In 25 years, from 1975 to 2000, world production has increased by a factor of 2.9, and per capita product only doubled.

. The OECD's share in world product is about 50 per cent, that of the Third World - including China - 32 per cent, and Eastern Europe almost 18 per cent.

. Per capita income levels are down compared with Scenario A, but the regional shares of gross world product are on the whole very similar, even if incomes are reduced in differing proportions in the various developing regions.

Scenario B3 does not result in major changes in the macroeconomic picture by the year 2000, even if it does increase Japan's share and reduce that of Europe. By the beginning of the next century, on the other hand, the diverging trend begins to produce significant disparities.

However, these similarities must not conceal the differences: new growth and traditional moderate growth impart quite different dynamics to the structures of the developed countries and to those countries' relations with the Third World. Examination of the sectoral aspects makes it possible to have a clearer idea of how different they are.

More moderate growth slows down the increase in energy consumption, especially in Scenario B1. But in that scenario the halting of nuclear development prevents a reduction in the demand for fossile fuels. The likelihood of an energy crisis is therefore not significantly modified.

(i) Slower growth has a very significant impact on energy consumption. The 7.0 MMTOE consumed by the OECD in Scenario A falls to 5.9 MMTOE in scenario B2 and 5.5 MMTOE in Scenario B1. Total world consumption falls from 14.6 to 13.2 and 12.4 MMTOE respectively (Table 47). In Scenario B1,the problems have not disappeared, however, even though they are of a different kind, since in Scenario A nuclear energy provided from 1.8 to 2.6 MMTOE, which is approximately the difference between Scenario A and B1. Assuming nuclear energy development to be practically halted, the volume of energy demanded from the fossile fuels remains the same and pressure on the energy market is hardly reduced. Since the basic facts with regard to solar energy can hardly be changed, an energy crisis due to the exhaustion of oil resources remains a probability by the beginning of the 21st century.

(ii) The two forms of slower growth also have an impact on agriculture:

The two forms of slower growth have quite different impacts on agriculture.

In Scenario B1, demand for meat and diary products in the OECD is lower than in Scenario A, in particular because of dietetic considerations. The production and processing of certain food products (like sugar, oil seeds, beef) are transferred more rapidly to the developing countries. In all, agricultural production at the end of the century is almost 25 per cent lower than in the strong growth scenario. Hence big shifts in manpower in agri-food activities - shifts which affect Australia and New Zealand in particular. At the same time, the liberalisation of trade allows the Third World to increase the value of its exports to the OECD. In all, the food situation in the developing countries improves appreciably under the combined effect of exports, aid for basic needs, and internal development strategies, even if per capita supply does not increase very much.

However, the new growth is not without problems in the developed countries:

. The change in values and life-styles is a source of contradictory demands. The desire to preserve the environment and have agriculture evolve towards a stable agri-ecosystem conflicts with a tendency to de-urbanise and to use farmland for residential and leisure purposes.

. The rapid structural adjustments involved in transferring agri-food activities to the developing countries come up against major constraints: an ageing farm population which is not very sensitive to economic forces, the lack of alternative agricultural activities to those transferred to the LDCs (for example, sugar accounts for between 10 and 30 per cent of income from crops in certain areas of the United States and Europe).

In Scenario B2, the combined effect of the slowdown in growth and the relative fall in aid means that agricultural production in the Third World is 20 per cent below that in Scenario A. While the drop is less than 10 per cent in the middle-income countries of Latin America, North Africa and Asia, it is above average in Sub-saharan Africa and South Asia. Even though per capita food supplies in the year 2000 exceed their 1970 level, unequal distribution causes widespread malnutrition.

Demand for food in the OECD countries is midway between that of Scenarios A and B1. Under the conditions of the Scenario, many OECD countries would be tempted to encourage their agricultural production in order to maintain incomes and jobs in agriculture and improve their trade balances; and hence a danger of surpluses increasing market instability and discouraging agricultural production in the developing countries.

The food products and beverages industry, which is a major provider of employment in most OECD countries (in terms of jobs, it is the leading industry in the Netherlands and the third in the United Kingdom), will experience a substantial fall in employment owing to the low growth of its markets, competition from the Third World and the development of automation - partly in response to pressure from governments which may seek to fight inflation by checking the rise in nominal consumer food prices.

Under the assumptions of Scenario B2 the international redeployment of industry intensifies. Whence possible tensions within the developed countries. Scenario B1 gives rise to very different forms of industrialisation in the Third World.

(iii) Industrial developments are no less significant. In Scenario B2 the introduction of new forms of international division of labour comes up against the structural rigidities of the developed countries and their differing abilities to adjust. Furthermore, the relative weakness of capital productivity in the OECD area exerts persistent pressure in favour of direct investment in those developing regions with potential for rapid industrialisation either because of their internal absorption capacities or because of their integration in the world market. In other words, confronted with the constraints on investment in the developed countries, the multinational firms react by making that investment increasingly international. Whence the ambiguity of their role: while they are an essential factor in industrialisation on a worldwide scale and hence contribute - mainly by the growth of intra-firm trade - to the extension of production capacities in their countries of origin, they are nevertheless seen to be aggravating the structural problems of those countries. It is not therefore out of the question that some OECD governments keep a closer watch on their activities. At the same time, by concentrating production units serving regional markets or the world market, and by splitting up production processes, the multinational firms facilitate the industrialisation of the developing countries and accentuate qualitatively and quantitatively the specialisation of the North in capital goods - qualitatively, because slower growth in the North encourages the multinationals to tighten their hold on the industrialisation of the Third World mainly through the technology built into capital goods, and quantitatively, because of the weakness of final demand which mainly affects other manufactures.

The annual growth of world industrial production in this scenario is slightly below 4.5 %. A marked slowdown in the OECD countries (3.4 % per year) is offset by the continuation - at a rate slightly higher than 7 % - of the past trend in the Third World. Compared with the high growth scenario, the main characteristics are as follows (Table 48):

- a slight fall in the shares of North America in the production of capital goods and other manufactures;

- a strengthening of Japan's shares which rise to 15 and 9.2 % respectively for machinery and other manufactures;

- an improvement in the relative positions of the Eastern countries;

- a very slight increase in the share of the Third World (not including China): 18.3 % for all manufactures, 13.5 % for capital goods, 20 % for the others, in terms of the definition for the Lima Declaration. Within the Third World differences widen; Latin America increases its relative shares; those of East Asia remain practically constant; those of the other regions decrease.

In Scenario B1 - which can hardly be quantified - industrial development is not based on the forms of industrialisation just described. In the developing countries the expansion of domestic markets, the reorientation of growth towards the satisfaction of the essential social needs of indigenous populations takes precedence over outward-oriented industrialisation or import-substitution, i.e. the model of consumption in the industrially-advanced countries is rejected.

The slowdown in growth not only reduces the rate of growth of international trade, but changes its composition.

(iv) As far as international trade is concerned, its growth will be of the order of 6.3 per cent in the B2 scenario (bearing in mind the regional breakdown adopted). Three major facts should be remembered:

. An appreciable slowdown of trade in oil products and, to a lesser extent, other mineral raw materials.

. A steep reduction in trade between the developed countries.

. An increase in the relative role of the Third World, whether with regard to its share in world imports of capital goods, its share in world exports or the percentage of total trade accounted for by trade between developing regions (Tables 50 and 51).

By making it easier for the regions of the Third World to achieve a degree of independence in their development process, Scenario B1 no doubt reduces the growth rate of trade in manufactures between North and South, and, at the level of products, changes the content of that trade. On the other hand, it no doubt gives rise to flows of oil products which are larger than those of Scenario B2 and almost as large as those in Scenario A.

(v) Finally, with regard to capital flows between the North and South, a feature of Scenario B2 is the increased importance of private flows compared with official flows, and particularly compared with aid which remains stationary at about the current level of 0.31 per cent of GDP. This substantially reduces external possibilities for financing investment in South Asia and Sub-saharan Africa, and is therefore one of the reasons for slow growth in these regions. On the other hand, foreign investment and loans play an essential role in the growth of the more industrialised developing regions. The financial profitability of these capital flows appear in the form of a reverse flow of repatriated profits, and licence and interest payments. It is an important element in the international management of financial capital during a period which is notable, in the developed countries, for the low profitability of capital. Scenario B1 naturally produces quite a different pattern of financial flows since it assumes considerable aid and a definite geographical orientation to the bulk of financial flows.

These few sectoral indications already suggest the difficulties and problems inherent in the scenarios for moderate growth. Analysis of them is instructive:

Discussion of the plausibility of the new growth scenario raises three questions:

- *What likelihood is there that the groups supporting the new values will become sufficiently powerful in an advanced industrial society?*
- *Is it realistic to expect parallel transformations of values in differing advanced industrial societies?*
- *Will the changes in values lead to a re-opening of the question of North-South relations, and will the countries of the South be prepared to participate in this re-opening of the question?*

(i) The new growth is not a form of gentle growth which alleviates the adjustments engendered by any rapid rise in national income. It implies on the part of the inhabitants of the developed countries the will to participate actively in a profound change in the way the social product is obtained and in its content and distribution. More equitable income distribution, the development of collective services, and the holding back of energy consumption to reduce the need to have recourse to nuclear energy must be accompanied by a fundamental reallocation of production factors within the economy. A lasting recovery in investment in certain sectors must be matched by extensive labour migration from industry to industry and, insofar as the geographical location of job creations and redundancies does not correspond to the demand for jobs, from region to region.

At this point, three essential questions arise as to the validity of the scenario:

. What are the chances, in an advanced industrial society, of growing power being exercised by avant-garde groups (youth, intellectuals, researchers, etc..) who are the bearers of these new values? The chances are small, if one abides by the analysis in Part III. Moreover, even if the new values were to be adopted by the majority, some groups might still resist structural change to the economy, either because they do not agree with the new values and refuse for example to accept a standstill or even a reduction in their incomes, or because the structural changes induced by the new growth are in contradiction with the demands generated by those new values (the desire to live in the country, for example).

The social consensus postulated by the scenario would be such that it would both stimulate investment by indicating clearly the developing trends in social demands, and reduce inflation by moderating

While it would be more stable and less conflictual if it were applied in all societies throughout the world, the new growth scenario would clearly encounter many obstacles in trying to establish itself.

conflicts over the sharing out of the surplus. But on these two points some scepticism is justifiable, especially as regards the opening stages of the scenario, because of the behaviour of groups which would oppose change if it were rapid.

. Is it realistic to expect parallel changes in values in differing advanced industrial societies? Excessive divergencies between countries would oblige the countries pioneering the new growth to adapt simultaneously to the new values and to new forms of international competition. The pressures will doubtless be too much, and the response could be a partial withdrawal from the international economic system, contrary to the assumption of trade liberalisation. This question concerns the European Economic Community first and foremost, with its strong economic integration, and its undeniable socio-cultural diversity.

. Will the change in values in the developed countries lead to new forms of conservatism compatible with aspirations for greater freedom and local participation, or will it cause the developed societies to reconsider the question of North-South relations, as is assumed in the scenario? For the second eventuality to take full effect, the powers of the groups in favour of basic human needs satisfaction must be strengthened simultaneously in the Third World. In this way, increased co-operation can start between the North and the poorest part of the Third World which, thanks to its increased autonomy, will have greater latitude to adopt scientific modes of production and models of consumption. On the other hand, what will be the reaction of the industrialising countries of the South, those which have already gone beyond a basic needs policy but have not attained the life-styles to which the post-industrial societies can aspire?

Hence the paradox which is at the centre of the world scenario of new growth (Scenario B1): while it is more stable and less conflictual than others if it extends to all world societies, it has to contend in its emerging state with a variety of obstacles if the various groups within national societies, the various advanced industrial societies, and the various groups of world societies are evolving at different rates.

This gives rise to two possibilities, which are moreover not mutually exclusive:

- that of the emergence of "pockets" more or less tinged with new growth ideas within moderate traditional growth scenarios, or more or less protectionist scenarios;

- that of seeing a slow but fairly general transformation of the content of traditional growth, with A or B2 type evolutionary paths progressively incorporating characteristic elements of the new growth.

The moderate traditional growth scenarios are characterised by internal conflicts within the developed societies, and by international conflicts among the developed societies, and between developed and developing societies. Whence a number of problems specific to this scenario.

(ii) The moderate traditional growth scenarios reflect a dual series of interdependent conflict: the internal conflicts dealt with in Part III, and international conflicts between developed societies which increasingly display the four following characteristics:

(1) Insufficient co-operation in macroeconomic management, the consequences of which are well-known: it is not always in the interests of countries with positive external balances to manage their growth in such a way as to reduce their surpluses; countries with balance-of-payments constraints consider other countries' growth as an established fact and gear their own growth to their export possibilities; lastly, the monetary system gives the United States room for manoeuvre which makes its behaviour largely unpredictable for other countries.

(2) Monetary mechanisms which amplify the unpredictability of trends in real terms.

(3) Sectoral competition which is all the more intense in that each country resists it with its own social and political rigidities.

(4) A lack of clearly defined long-term policies with regard to energy (and, more generally, the management of natural resources) which, by increasing the degree of uncertainty, reduces the expected return on investments.

Compared with Scenario A, these conflicts within and between developed societies to some extent reinforce the tendency of multinational firms to invest in certain regions of the Third World and to internationalise production. They also prompt developed country governments to encourage exports of capital goods to the developing world - whatever the technologies employed. Although beneficial in the medium term, these two series of measures can, in the long term, aggravate conflicts between certain regions in the North and South.

This gives rise to a number of problems peculiar to this scenario:

. The question of the amount of indebtedness and the solvency of the developing regions is more crucial than in the strong growth scenario. There are at least three reasons for this: the fall in export earnings as a result of sluggish demand in the developed countries, the decrease in international liquidity following the decline in oil surpluses, the relative stagnation of aid.

. The political developments already revealed in the strong growth scenario are even more accentuated: the main developed regions see their relative power decline; the European Economic Community has to contend with more serious difficulties as regards structural adjustments, while Japan redirects its growth in a more marked manner towards the developing regions by means of trade and international investment; the industrialising regions in Latin America and South-East Asia enjoy relatively rapid growth, benefit from more modern productive investment, gradually acquire technological know-how and, as a result, improve their position even if some countries have to overcome difficult problems of solvency.

. The permanence of trade liberalisation is liable to come up against a socio-political rejection of structural adjustment both in certain developed countries and in certain industrialising countries. In the context of the scenario, therefore, it may be difficult to increase or even to maintain that liberalisation, with two alternative results: either the opening-up of trade does not immediately reach the intensity postulated in the scenario, and the course of subsequent events his midway between scenarios B2 and D; or the opening up of trade does indeed take place, but the difficulties of structural adjustment provoke a hostile reaction from the public which compels governments to adopt protectionist policies, and the scenario ends in a breakdown which leads to a scenario of type D.

Compared with Scenario B2, Scenario B3, with its accentuated differences in productivity, undoubtedly intensifies the conflicts between the main developed poles, but primarily from the end of the century onwards. At the same time it increases the need for new forms of international co-operation.

A hypothetical breakdown in North-South relations (Scenario C)

In recent years some representatives of the developing countries have advocated collective self-reliance for the Third World and disengagement from relations with the North....

In political statements or publications in recent years, many Third World representatives have argued in favour of a thorough review of relations between the North and South. They have seen this as a tactic to force the developed countries to make major concessions, or as a permanent means of creating an environment conducive to development strategies centred on basic needs satisfaction. Was this not, in fact, the essence of Chinese policy from the arrival of communism until the death of Mao Tse-Tung? And is not one of the major world models - that of the Bariloche Foundation - based on the assumption that the three continents of the South will pursue their development in virtual isolation from each other and from the North?

Since the analysis deals with a trend of events very different from that of the present situation, the assumptions it makes are important.

It is worthwhile therefore to explore the possibility of a hypothetical breakdown in North-South relations, even if the rivalry between American and Soviet influence in the Third World,present trends in China and the preferential relations between certain countries in the North and South reduce its political plausibility before its economic probability is even considered.

Inasmuch as the analysis relates to a trend of events very different from that of the present situation, it is difficult to avoid some degree of arbitrariness. The assumptions made must therefore be clearly presented:

Dissatisfied with progress towards a new international economic order, the Third World countries (excluding China) adopt, at the start of the coming decade, a policy of collective self-reliance. Vis-à-vis the OECD, theymake it a priority to break the links that they consider to be responsible for their dependence on the North, particularly in the area of direct investment, international trade and raw material prices.

Naturally these new strategies are accompanied and supported by profound modifications in the power structure and by changes in the values of the ruling groups in the Third World; greater emphasis is placed on equality and on the requirements of the poorer sections of the populations of the developing countries.

As for the OECD countries, they reinforce their co-operation centred around the USA, as they did after World War II, and endeavour to liberalise even further their trade with each other. They continue to experience a twofold social fragmentation and value changes which are not unanimously accepted, as in Scenario B2. However, they are variously affected by the breakdown which makes it impossible to assume that their productivities will converge with the long-term productivity trend of the United States.

In view of the attitude of the Third World, the OECD reduces official development assistance to 0.1 per cent of gross domestic products and, for humanitarian reasons, devotes it to Sub-saharan Africa and South Asia. The OPEC countries partially compensate for this reduction by tripling the volume of their own aid.

Although they favour the South, the OPEC countries cannot avoid supplying oil to all the purchasing nations. They endeavour nevertheless to increase the price which, by the end of the century, reaches twice its 1978 price in real terms.

The reduction of foreign aid and investment leads to a 10 per cent drop in gross investment in Latin America, South Asia and Sub-saharan Africa, and a 25 per cent drop in South-East and East Asia; however, over a period of 10 years, the increase in domestic savings in those regions brings investment rates back to their former level.

In the absence of a breakdown, the trend of the world economy would be as outlined in Scenario B2. The SARUM parameters are chosen accordingly, and the growth paths are initially the same as in Scenario B2; however after the breakdown has been introduced into the simulation, the new trends are determined endogenously by the model.

The North-South breakdown slows down growth in both North and South, the percentages varying according to region.

The macroeconomic picture of the scenario transmits a quite unambiguous message: North and South are seriously affected by the breakdown (table 21). Between 1975 and 2000, world production is increased by a factor of only 2.4 and the average per capita income is only 1970 US $ 1,500 at the end of the century. The setback is serious, its impact varying from region to region.

Within the OECD, the least affected region is North America; its share of world income falls by only 30 per cent instead of 40 per cent in the strong growth scenario, but per capita income is nevertheless slightly lower than in Scenario B2. The European Economic Community is much harder hit, its share dropping by 40 per cent compared to 30 per cent in the strong growth scenario. Per capita income is barely $ 4,500. As for Japan, its share falls from 6.3 to 5.3 per cent, and per capita income now grows by only 1.9 per cent per year, i.e. approximately 3,600 US 1970 dollars at the end of the century.

The Third World's share in world income is now 33 per cent, but per capita income is only $ 640, as against 890 in Scenario A. The loss is significant, even though its impact is partly offset by better income distribution.

In this scenario, the developing countries' rejection of the forms of internationalisation division of labour featured in Scenarios A, B2 and B3 is no doubt one of the major, if not the essential factor causing the breakdown. There are internal political reasons for this rejection which cannot be ignored when we come to consider the sectoral dimensions of the scenario.

The rejection of the forms of international division of labour based on the homogeneisation of production processes by reference to developed country norms, on the fragmentation of those processes, on integration into the world market, and the desire to evolve a self-centred development model do not arise out of quantitative claims as regards growth. They are based on political claims which give priority to basic needs satisfaction, egalitarian distribution of incomes, the development of mass consumption along lines different to those prevailing in the North, the mastery of the process of accumulation which implies having their own technological capability and putting an end to their dependence on industrial exports to the developed countries' markets.

Clearly the development strategies implemented in Scenario C are closer to those of Scenario B1 than those of Scenarios A,B2 and B3. However, the breakdown gives rise to major constraints. While the financial constraint can be partially removed in the case of certain countries or regions by substantially increasing raw material prices, the technological constraint arising from the reduction of technology transfers effected under the aegis of the multinationals compels the developing countries to devote considerable resources to research and above all to development and the adaptation of techniques.

Furthermore, two factors will influence the way their investment is oriented. The desire to achieve independence as regards food, without which the scenario is not viable, will necessitate giving priority to investment in agriculture - at least initially. For a large number of countries, and particularly those poorly endowed with raw materials, the accumulation of capital can only be developed on the basis of productivity improvements in agriculture . It is therefore essential to give priority at the start to investment which will make those improvements possible: investment in infrastructure and certain capital goods industries. Only later will it be possible to develop industrial production aimed at mass consumption.

For the OECD countries, besides the slowdown in industrial production which is an automatic consequence of slower growth, the breakdown and the "disengagement" will result in increased international specialisation in the advanced countries, including the Eastern countries. This increased specialisation will take place in the context of co-operation centred around the United States which, in this scenario, reverts to its role as leader of the Western World.

What are the sectoral aspects of this scenario?

The significance of the scenario can be appreciated more thoroughly by means of a brief sectoral analysis.

- Energy consumption is steeply reduced in the OECD countries,...

(i) The energy picture reflects the slowdown in growth: at the end of the century, energy consumption is about 12 MMTOE, i.e. 1.2 MMTOE less than in Scenario B2. The bulk of the difference comes from the reduction in OECD consumption, which falls by about 1 MMTOE. Third World consumption is only moderately reduced, but is differently distributed: the most industrialised regions of Latin America and East Asia are consuming more, whereas consumption in the less developed regions has fallen steeply. The moderate levels of OECD countries' consumption should not conceal their supply uncertainties which result from the ambiguity of the positions of many OPEC countries torn between North and South.

- In agriculture, production for home consumption increases in North America and Western Europe; Japan increases the ratio of consumption covered by national production; in the Third World the socio-political changes changes inherent in the logic of the scenario are reflected in a more equitable distribution of the supply of food products,...

(ii) The logical consequences of the scenario for agriculture are no less interesting:

For the OECD countries, the slower increase in incomes restricts demand for meat and ofr luxury goods from the Third World: tropical fruits and out-of-season vegetables. Poor industrial growth makes it easier for governments to maintain the parity of agricultural incomes, although the employment situation prompts them to maintain and even expand agricultural employment. For domestic reasons, therefore, they are tempted by a certain agricutural protectionism. In any event, the persistence of barriers against imports of goods from the Third World (beef, sugar, oil plants, certain vegetables) and the lack of assistance to the developing countries for the production of exportable goods makes it possible by the year 2000 to increase agricultural production for domestic consumption by 20 to 30 % in North America, the EEC and the other European Member countries of OECD. For Japan, the loss of industrial markets in the developing countries and the non-liberalisation of agricultural markets mean an increase of some 5 % in the proportion of consumption covered by national production (instead of a reduction of 50 % in Scenario A!). Australia and New Zealand lose markets both in the OECD and the Third World. The only increases are in their exports to North America which partially replace exports from Latin America. Because of the socio-political changes inherent in the logic of the scenario, domestic demand for food products falls by 20 % in value compared with Scenario A.

In the Third World it is no doubt difficult to practice satisfaction of basic needs policies without substantial socio-political changes, since the low level of aid and the fall in agricultural exports earnings affect the poorer sections of the population, particularly in Sub-saharan Africa and South Asia and make it barely possible to keep disparities at their present level. Latin America, the Middle East and North Africa are the only regions which increase their agricultural production for domestic consumption more than in Scenario A.

In all, a food situation not very different from that in scenario A: reduced consumption of luxury foods in Europe; maintenance of traditional food patterns in Japan and in many developing countries; reduced production in South Asia and Sub-saharan Africa, with per capita supply lower than in Scenario A but 20 % above its present level. However, because of the socio-political changes inherent in the logic of the scenario, distribution is more equitable and there is less malnutrition in the Third World.

As far as costs are concerned, increased production in most OECD countries results in cost levels which are 10 to 20 % higher than in Scenario A. In Australia and New Zealand, on the other hand, both production and costs fall. Production costs also rise in the Third World - in the region of 10 % in Latin America, 20 % in the Middle East and North Africa and 40 % in East Asia, while the decrease in production in Sub-saharan Africa and South Asia hardly has any effect on costs in those regions.

The volume of trade in agricultural and food products is reduced by comparison with Scenario A, but above all it changes in structure: a decline in trade within the OECD; a fall in exports from North America to the OPEC countries; a decrease in Third World exports to the OECD, not offset by the growth of trade within the Third World. Thus, Latin America loses 90 % of its exports to the OECD area, but increases its exports to the rest of the Third World by 40 to 100 %. The situation is even more serious for Sub-saharan Africa which loses most of its markets in the OECD countries.

- Industrial production increases more slowly, particularly in the OECD countries; its distribution changes in the Third World,...

(iii) What industrial picture does the scenario project?

. The world industrial growth rate falls from 4.4 % in Scenario B2 to 3.2 %.

. In the OECD countries the elasticity of industrial production compared to total production is something approaching unity.

It is higher than in Scenario A, because of the halt in the trend to transfer production locations to the Third World. Overall, the growth rate is 2.3 %, i.e. a fall of one third compared to B2.

. In the developing countries, the elasticity decreases at the beginning of the period because of the lack of external financing and the priority given to agriculture and infrastructures. It is not likely to increase strongly until the last decade of the century when the level and distribution of incomes will allow a start to be made on mass consumption. The final result? A growth rate of 6.4 % as against 7.1 % in B2.

. The Third World (excluding China) should nevertheless see its share of world production come very close to the Lima target: from 21 to 22 %. But differences between regions in the Third World widen, since it is the most industrialised areas, Latin America and South-East Asia and the oil-producing areas (in particular North Africa and the Middle East) which benefit from the trade opportunities provided in the breaking off of relations with the North, whereas the shares of South Asia and Sub-saharan Africa decrease (Table 49).

- Intra-Third World trade and intra-OECD trade account for larger shares of world trade than in the other scenarios,...

(iv) Scenario C is bound to have substantial repercussions on the growth and geographic pattern of world trade. Since the steep fall in North-South trade is not offset by the expansion of trade between developing regions, the annual growth of world trade is barely 5 % in this scenario.

Table 50 illustrates the geographic pattern of trade in manufactures:

- Exports of OECD countries to the Third World in the year 2000 are now only 10 % of world trade compared with 26 % in 1970 and 20 % in scenario B2, while Third World exports to the OECD fall to 5 % of world trade as against 12 % in Scenario B2.

- Intra-OECD trade accounts for a much larger proportion of total OECD trade than in the other scenarios.

- The share of internal trade between the developing regions is, on the other hand, substantially greater. It now amounts to 13 % of world trade as against 1.1 % in 1970 and 6 % in Scenario B2.

- The regions of the Third World differ considerably in their ability to react to the slump in North-South financial flows

(v) Finally, as regards capital flows, the first significant factor is the reduction of OECD aid to 0.1 % of national incomes. By the end of the century, South Asia and Sub-saharan Africa are receiving about 10 US 1978 $ per head and some food aid. The decline in loans and direct investment is a serious blow to Latin America and the Far East, but the growth of their exports to the Third World facilitates their economic recovery. The same is not true for Sub-saharan Africa and South Asia.

The scenario would also have important institutional consequences.

A breakdown between North and South would naturally have far-reaching institutional consequences. For example, a decline in the activities of the World Bank would be accompanied by the emergence of intergovernmental economic institutions within the Third World.

To sum up: this is a scenario with a low degree of probability, and even if it did materialise, it would not be able to continue for long. But it is a useful scenario in that it helps to understand what could be, no doubt, in an attenuated form, some of the features of tomorrow's world.

Two questions to conclude this analysis: is such a breakdown conceivable? Would it be lasting?

The political preconditions for an economic fragmentation of this kind are very far-reaching. The major conflicts between developing countries would have to disappear and the Third World would have in practice to disarm, thus putting an end to its present dependence on the East and the West for armaments. This hypothesis is all the more improbable in that it would have to take place in the context of the continuing political and military rivalry between the United States and the USSR.

But if the breakdown were to occur, could it last?

One is bound, first of all, to note the magnitude of the upheavals that it would cause: a general decline in growth, massive redeployment of economic activities in both North and South, a complete change in the financial flows patterns, the need for intensive energy saving policies inasmuch as all the oil-importing regions have constraints regarding balance of payments equilibrium. Under these circumstances, would the Third World countries be able to maintain their political and social cohesion? Even though advantages and losses would be very differently distributed from one country to another? Even though the present lack of balance between North and South would be re-created within the Third World - between the industrialised countries and the others - admittedly on a smaller scale? Even though voices from the North would be very tempting - with Japan ready to pursue a policy of co-operation with South East Asia in order to recover a minimum degree of prosperity, and the European Economic Community anxious to solve some of its problems by strengthening their ties with Africa and certain countries in the Middle ast or Latin America?

This could mean that Scenario C could simply give rise to protectionist scenarios rather than an enlarged common market of OECD dimensions.

However, this conclusion does not a posteriori rule out introducing a breakdown scenario in the range of scenarios discussed, since the lessons to be learned from the scenario are important in more ways than one:

. It shows everything that North and South can lose by failing in the long run to find ways of co-operating.

. It affords a better understanding of the aspirations peculiar to certain Third World elites in their search for forms of development free of the influence of the advanced industrial societies.

. It furthers analysis of the reciprocal threats that may periodically be brandished by the different parties involved in the vast diplomatic contest of the coming decades.

. Lastly, it contains, in an extreme form, features which could undoubtedly exist in attenuated form in the world of tomorrow, such as those of preferential co-operation between Third World countries.

New forms of protectionism within the OECD (Scenario D)

Scenario D explores the consequences of an increase in protectionism between the major areas of the OECD, coupled with moderate traditional growth in the North and the development of preferential links between certain areas of North and South.

In the analysis in Part III and the discussion of the previous scenarios, reference has frequently been made to the danger of reverting to concealed forms of protectionism. This eventually must therefore be explored; it is an eventuality which can be linked with a whole range of possible futures: protectionism which, by facilitating structural adjustments, is paradoxically conducive to a recovery of growth in the developed countries; protectionism of the new growth based on value changes which enables the major developed areas to make divergent choices; protectionism coupled with moderate traditional growth, which is a response by the advanced industrial societies to the pressures of structural adjustment in a situation of slower growth and social fragmentation.

It is this last eventuality - the most plausible of this group of possible futures - which we shall consider more particularly in Scenario D.

We already know that any protectionist scenario accentuates the rivalries between the major developed poles for influence in the various regions of the Third World. In this respect, Scenario D opts for a caricature which is exaggerated, but useful for analytical purposes. It assumes that the three principal OECD poles develop preferential links with specific regions in the Third World which become their partners. Obviously, the political and economic reality of the world is a great deal more complex, but, as we have already stressed, the scenarios are intended as a guide to assist reflection, not forecasts?

To outline the assumptions:

The calculation assumptions are necessarily somewhat arbitrary, but give a clear idea of the underlying meaning of the scenario.

At the beginning of the 1980s, the developed countries experience great difficulty in adapting to the type of evolution described in Scenario B2. The OECD is unable, as an institution, to find enough common interests among its Member countries to prevent an increase in direct or indirect trade barriers between 1980 and 1985. The calculations assume that, compared with Scenario B2, the trade biasses between the three poles double by 1985 with respect to capital goods, energy, minerals and food products, and triple for consumer goods. These figures are maintained up until the end of the century. Trade rivalry between the three major poles of the OECD gives rise to preferential North-South relations: a closer association between North America and Latin America; Japan develops links with the ASEAN countries, with other countries in the Far East and, to a lesser extent, with South Asia; there is co-operation between the European Economic Community and Sub-saharan Africa, the EEC also developing a number of preferential trade links with North Africa and the Middle East. To interpret these assumptions quantitatively, the scenario assumes that, as compared with B2, the trade biasses are reduced by one third for all non-food products inside each North-South "area". For food products, however, the countries of the South raise by 15 % the biasses against their Northern partners to increase production in line with their basic needs objectives.

In this scenario, there are three groups of countries not participating in any specific economic alignment: the USSR and the Eastern countries; China; Australia, New Zealand and the Republic of South Africa. The OPEC countries maintain a neutral attitude towards their oil exports. The last major assumption is that the OECD countries increase their official aid in percentage terms as in Scenario A, but distribute it regionally within the Third World on the basis of their economic relations.

Two features emerge from analysis of the macroeconomic growth paths:

- *the major poles of the North are differently affected by protectionism;*
- *the impact of protectionism, while considerable during the first decade, decreases during the second.*

The macroeconomic picture that emerges in the scenario from these proposals is interesting above all for the regional differences that it introduces compared with Scenario B2 (cf. Tables 21 and 22 in Part II).

Towards the end of the century the three poles of the OECD, by restructuring their economic activities, partially succeed in offsetting the effects of the trade constraints in the North, and in benefitting from the liberalisation of their trade with certain areas in the South. In all, the reduction in world income is slight: world income increases by a factor of 2.8 compared with 1975, as against 2.9 in Scenario B2.

The regional effects are more pronounced, however:

. Thanks to the complementary nature of resources available in the two Americas, North America slightly improves its per capita income by comparison with scenario B2. Latin America, on the other hand, is affected by the loss of its European and Japanese markets, and by barriers to trade within the Third World; its per capita income falls by a few per cent. While not attaching too much importance to the figures themselves, it is worthwhile noting the relative robustness of the United States economy in the face of an extension of protectionism inside the OECD, at least assuming that relations with the OPEC countries are maintained and ties with Latin America strengthened.

. Although seriously affected in the medium term, Japan soon steps up co-operation with South East and South Asia. The fact that supplies of resources in the area are not fully complementary limits the effectiveness of this integration, although it does have the advantage of the economic neutrality of Australia, New Zealand and the OPEC countries. Compared with Scenario B2, structural ajustments and reduced access to European and American markets reduce by 5 to 10 % the growth in Japan's per capita national product by the end of the century. Thus in the year 2000 the average per capita income is still 1,000 US 1970 $ below that of the United States, and not $ 200 or more greater as in Scenarios A, B2 and B3.

. The European Economic Community is the most seriously affected by the protectionism of the North. It is associated with Sub-saharan Africa and, to a lesser degree, South Asia. These regions include poor countries at very varied stages of development, whose productive capacities are limited and whose markets can hardly replace for the EEC those lost in the other OECD countries or in the industrialising countries. Quantitatively speaking, the national products of the EEC fall 10 % short of those given by Scenario B2, average per capita income being only 60 and 70 % of that of the United States and Japan respectively. Sub-saharan Africa's income, on the other hand, is 20 % higher because of better access to European markets and more sustained assistance to agricultural development. The situation of South Asia is less sensitive to trade and aid, and consequently changes very little. Naturally in a scenario of this kind the European Economic Community would try hard to develop Euro-Arab co-operation and extend it to co-operation with Africa as a whole.

. The other Western European countries, whose economies are closely bound up with those of the Community, are variously affected by the consequences of the developments described above.

. Australia and New Zealand, on the other hand, take advantage of the bigger role they play as suppliers of food products for Japan and East Asia. Their national income in the year 2000 is 10 % higher than in Scenario B2.

. Finally, North Africa and the Middle East have very much the same per capita income as in Scenario B2, this being a consequence of the neutrality of OPEC.

These changes are illustrated in the distribution of world income (Table 21): an increase of 1 % for North America, and a fall for Europe and Japan. Nothing, however, would be more dangerous than to confine oneself to this apparently reassuring statement - this for two reasons:

- Compensating for protectionism in the North by liberalising certain areas of North-South trade would result in a legitimate desire among Third World countries to ensure for themselves some degree of economic independence - even at the cost of reduced incomes. In this case, instead of the scenario described, ought one not to expect an even greater fragmentation of the world economic system? In terms of income, the effect would be much more unfavourable.

- Just as moderate and temporary protectionism holds back structural adjustments, so permanent and vigorous protectionism ultimately leads to much more drastic adjustments being required. The final image of the scenario should not therefore mask the difficulties encountered on the way which would either lead to a reduction of protectionism to a more modest level, or cause profound upheavals. In this connection, Table 22 is instructive. By 1990, the three major poles of the

OECD have lower per capita incomes than in Scenario B2. While the shortfall is tiny for North America, it amounts to 27 % for Japan and 17 % for the EEC. These figures must be regarded with caution: the model used can only qualitatively evaluate the extent of the impact of protectionism around the year 1990 (a protectionism which would in reality be much more differentiated by sector and by product) and, in the other direction - probably - overestimate the ability of the developed economies to adjust to that impact; so the model projections suggest that the three poles have largely absorbed the effects of the rise in protectionism by the end of the century. With these reservations, the broad trends nevertheless seem possible.

The sectoral analysis confirms this judgement.

The most interesting aspects of the sectoral analysis of Scenario D concern agriculture, industry and international trade.

(i) As regards energy (table 47), a phenomenon already described in Scenario C turns up again: the slowdown in foreign trade compels countries to pay great attention to conservation. But if, in addition, Western Europe and Japan find it more difficult to obtain North American coal, Mexican oil and the American continent's non-traditional sources of fossile fuels, they will have to turn to the coal of Australia, South Africa, and possibly Poland, the USSR and China. They will also no doubt endeavour to develop solar energy. As regards nuclear energy, one question only: will the spread of protectionism have any effect on deliveries by the United States of enriched uranium?

(ii) What will be the agricultural and food situation?

The agricultural sectors of North and South America are competitive rather than complementary. The loss of their markets in the rest of the world would therefore create major problems in the Scenario D context, since, particularly in North America, the farming community and agri-food business are powerful political forces.

Being compelled to redeploy its industry, Japan would seek to prevent any increase in its food prices by keeping imports at a high level. The bulk of these would come from Australia, New Zealand and its partners in South and South East Asia. According to the estimate contained in the scenario, Japan will produce 35 % of its food requirements by the end of the century (27 % in Scenario B2).

In the European Economic Community, food production increases during the coming decade because of the barriers erected against imports from North and South America and the decline in industrial exports. By the year 2000, production is 5 % higher than in Scenario B2, with lower domestic demand. The other European countries also cover a large proportion of their requirements.

Developments in the Third World are varied in relation to Scenario B2: nutritional conditions in Latin America are improved; African agriculture receives substantial aid from Europe, increases its production by 10 % and its per capita supply by 5 %; East and South

East Asia expands its production of basic food products; some countries in South Asia are worse off.

(iii) As regards industry, the world growth rate is slightly higher than that in Scenario B2. But besides that similarity, what the scenario highlights is the effect of protectionism and the impact of the changed pattern of trade on the development of the international division of labour both in the North and between North and South. First, the increased protectionism will have a disastrous effect in the North on the growth of productivity in industry while contributing to increased industrial employment in regions with high import elasticity. Second, to maintain the stability of their relative positions, compensate for their lost exports, and guarantee their access to raw material resources, the three developed poles will no doubt have to make some concessions to the developing countries they wish to keep within their areas of influence. These two factors can give rise to profound structural changes in sectors in which the internationalisation of production is already at an advanced stage. In particular the developed poles might be led to speed up the investment process in certain emerging developing countries so as to help them to develop their domestic (or regional) markets which offer outlets for exports from the North. Massive North American aid to Latin America facilitates the growth of the sub-continent's internal market for food and consumer goods, which benefits local industrial production. Sub-saharan Africa and South Asia, for their part, derive some advantage from the reduction in competition from the most industrialised Third World countries. Consequently, industrial output grows more rapidly than in Scenario B2. South East Asia, however, loses substantial markets and has to convert some of its activities in line with its relations with Japan.

(iv) The projected evolution of international trade confirms these changes.

From 1970 to the year 2000 the growth rate of trade in manufactures between regions falls to 6.6 %, as compared with 6.9 % in Scenario B2, 5.2 % in Scenario C,and 8.9 % recorded between 1960 and 1975. One conclusion can be drawn: between major areas, trade is more affected by the North-South breakdown than by the extension of protectionism between poles in the North.

As to the rate of growth of trade between OECD regions, it is less than 70 % of that in Scenario B2, and the reduction in trade between the three poles is even greater. By about 1985, exports of consumer goods from Japan to North America and the EEC are, respectively, 25 and 15 % lower in value terms than in Scenario B2.

At the same time, North-South trade expands. Developed countries' exports to developing countries increase at an annual rate of 7.5 %. Imports increase at a similar rate of 8.9 % per year. The corresponding figures for scenario B2 are 6.0 % and 8.2 % respectively. This does not prevent a serious crisis at the half-way point, around 1990. By comparison with scenario B2, Japan sees its export earnings reduced by 30 %, North America and the EEC down by about 15 %. From 1990 onwards, the depressing effect of the profound upheaval in the pattern of world trade becomes more moderate and begins to be offset by the increase in trade flows within the North-South alignments. Thus by the end of the country exports of manufactures from OECD countries are no more than 10 % below the figures given by B2, North America being at practically the same level, the EEC almost 90 %, and Japan just under 90 %.

These trends linked with the growth of protectionism completely transform the matrix of world trade, whether the basis for comparison is the flows observed in 1970 or those forecast in the year 2000 for Scenario B2(Table 50). By the end of the century, domestic trade in the OECD only accounts for 24 % compared with 36 % in B2, while exports from the Third World to the OECD amount to 17 % compared with only 11.8 %.

(v) An examination of capital flows concludes this brief sectoral survey. Under the assumptions in the scenario Latin America is receiving more than 40 US 1970 $ per head by the end of the century. These flows are sufficient to reduce income disparities inside and between countries, give considerable impetus to demand for food products and consumer goods, and facilitate the emergence of strong growth rates. In contrast, Sub-saharan Africa and South Asia receive less than in B2, but the richest countries in these regions have the advantage of direct private investment from the EEC. As for South East Asia, the amount of aid that it receives is midway between the 1970 level and Scenario B2, but it is the scene of considerable direct investment by Japan.

The scenario obviously does not give any clear idea of the multitude of possible protectionist futures, it shows:

- *the extent of the consequences of protectionism;*
- *the curbs that would prevent it from becoming general.*

There is no need to emphasise that this scenario raises a great many questions. But before examining them, a reservation must be made: a really protectionist situation would be enormously complex, with infinite variations by product and by country. It would only be established gradually through a succession of actions and responses. Scenario D can therefore be no more than a very inadequate reflection of the multitude of possible protectionist futures.

Having said that, it is legitimate to ask what are the consequences and viability of the scenario.

First, the consequences: The scenario would bring about profound changes in economic structures, not only in the countries of the North, Japan and Europe in particular, but also in the newly industrialising countries. Changes would have to occur in the major industries which are highly dependent on international markets: motor vehicles, electronics, aircraft construction, engineering, data processing. The multinational companies, which have for many years contributed to the development of the different markets and have exploited the comparative advantages of the different countries, would be obliged to redeploy their activities. The same would be true of Third World enterprises: enterprises in South East Asia which had won markets in Europe and North America; enterprises in Latin America exporting to Europe. All this could not take place without structural unemployment causing serious repercussions in the OECD countries. The increase in the prices of certain products resulting from the cutback on imports would strengthen inflationary trends in Europe and North America. From the monetary viewpoint, the scenario would accelerate changes in the international monetary system and would no doubt facilitate the emergence of several reserve currencies. Two important questions remain: what would happen to the cohesion of the countries of the European Economic Community, bearing in mind the unequal distribution between them of advantages and disadvantages? What would be the reaction of the USSR and the countries of Eastern Europe - and also, to a lesser extent, China - not only on the economic but also the political plane?

These consequences suggest a tentative answer as to the viability of the scenario. Since industrial redeployment, the rigidities in the developed countries, and attitudes in certain developing countries make Scenario B2 unstable and may result in more pronounced protectionist trends, many of the parties involved will be against these trends:

- in the Northern countries because they will be seriously affected during the adjustment phase;

- in the Southern countries because they wish to avoid preferential alignment on one of the major economic poles of the North.

The limits to any possible fragmentation are thus confirmed. These limits were already announced in Part II when the dimensions underlying the preparation of scenarios were presented.

What then would be the outcome of this twofold trend towards increasing protectionism, but at the same time putting limits on its generalisation. No doubt States would play an increasing role in regulating international trade. The main object of this role would be to ensure the maintenance of broad trade flows, while at the same time enabling each State to co-ordinate the international activities of its economic transactors, though this would conflict with the internationalisation of the banking system, and the internationalisation of industrial production under the aegis of the multinational firms. The extent of this co-ordination would vary considerably from one country to another, but superimposed on the internal social oligopoly could be an international politico-economic oligopoly in which the major States would be more or less like the leaders of a more or less close-knit coalition of their enterprises.

What the scenarios contribute

The scenarios enable us to examine some of the main springs of the world economy in the next twenty five years, but we now need more detailed descriptions of:

Probing as they do from such different directions, the scenarios make it possible to strip down and examine some of the main mechanisms of the world economy over the next twenty-five years. They help us to be aware of the advantages and constraints which characterise the situations of the main countries. A picture begins to emerge of those future trends which, in the absence of adequate governmental policies, would be the most likely to occur. The nexus of difficulties at the heart of the management of global interdependence begins to appear.

Table 46

Scenarios A and B2 : Estimates of GDP from 1975 to 2000 for a sample of OECD countries assuming converging productivity

(billions of US 1970 dollars)

	GDP				
	1975	1990		2000	
		A	B2	A	B2
Belgium	30.9	61.3	49.5	87.7	67.0
France	168.3	370.7	295.5	524.1	407.5
Germany	204.3	421.4	319.4	502.0	291.7
Italy	103.3	291.0	206.9	435.0	304.0
Netherlands	36.7	77.4	66.1	99.1	84.6
United Kingdom	134.3	239.4	201.9	336.6	261.6
Sub-total EEC countries	677.8	1461.2	1139.3	1984.5	1516.4
Sweden	37.0	64.2	53.9	84.4	68.7
Australia	41.3	79.9	69.2	107.4	93.0
New Zealand	7.5	13.5	11.3	15.7	14.7
Canada	103.3	184.7	162.9	262.0	210.7
Japan	255.6	766.9	653.0	1365.3	1095.2
United States	1041.1	1864.3	1598.6	2418.0	1991.9
TOTAL	2213.5	4434.7	3693.6	6237.0	4990.6

Table 47

World demand for energy in Scenarios A, B1, B2, C and D

(in millions of TOE)(1)

	1975	2000				
		A	B1	B2	C	D
North America	1904	3298	2729	2882	2551	2847
Japan	334	1036	786	895	523	769
EEC	928	1919	1491	1604	1251	1451
Other European OECD Member countries	232	623	447	495	388	458
Australia and New Zealand	68	122	91	97	90	96
Total OECD	3466	6997	5544	5876	4803	5621
USSR and Eastern Europe	1359	3090	2998	2998	3090	2769
Latin America	209	1493	(2)	1300	1336	1219
South Asia	103	424	-	379	250	310
East and South Asia	79	566	-	479	493	438
China	326	1774	-	1773	1774	1774
North Africa and Middle East	28	200	-	152	152	151
Africa south of the Sahara	21	94	-	79	60	105
Total developed countries	4840	10112		9019	7937	8437
Total developing countries (including China)	766	4510	4161	4161	4065	3997
World total	5606	14622	12449	13180	12002	12434

(1) South Africa is included in the world total and total developed countries, but not in any region.

(2) Scenario B1 has not been calculated region by region for the Third World since it was difficult to show with any precision the influence on those regions of changes in growth in the OECD area. By using the same figure as for B2 for the consumption of the Third World as a whole, the scenario no doubt overestimates that consumption, bearing in mind the change in type of growth.

Table 48

Trends in world industrial production 1970-2000 (scenarios A and B2)

	Growth rate of world value added 1970-2000						Regional distribution of industrial value added								
	Machinery		Other products		Total		Machinery			Other products			Total		
								2000			2000			2000	
	A	B2	A	B2	A	B2	1970	A	B2	1970	A	B2	1970	A	B2
OECD	4.6	3.7	3.9	3.2	4.0	3.4	75.4	61.6	59.4	67.1	49.2	48.6	68.5	51.4	50.5
United States	3.5	2.6	3.0	2.2	3.1	2.3	31.1	18.7	17.0	30.4	17.2	16.4	30.3	17.3	16.5
Canada	4.1	3.2	3.8	2.9	4.0	2.9	2.9	2.2	1.9	2.7	2.0	1.8	2.7	2.0	1.8
Japan	6.3	6.0	6.0	5.6	6.0	5.7	10.6	13.5	15.0	6.5	8.4	9.2	7.1	9.0	10.2
EEC	4.4	3.5	3.7	3.1	3.8	3.2	26.4	22.0	21.0	21.3	14.5	14.8	22.4	15.8	15.9
Other countries	6.4	4.8	5.4	4.4	5.5	4.4	4.5	5.8	4.4	6.5	7.2	6.3	6.2	7.0	6.1
Eastern Europe	6.4	5.6	5.2	4.9	5.4	5.0	17.2	21.8	21.5	19.9	21.0	23.6	19.3	21.0	23.2
China	8.1	8.0	7.3	7.3	7.4	7.3	2.7	4.3	6.3	4.5	8.8	10.2	4.2	8.0	9.6
Third World	9.0	8.3	7.5	6.9	7.6	7.1	4.6	12.3	12.6	8.4	17.2	17.9	7.7	16.4	16.7
Latin America	9.2	8.7	7.9	7.4	8.1	7.6	3.0	8.2	8.9	4.2	9.7	10.0	4.0	9.4	9.9
East and South East Asia	8.4	7.8	8.3	7.5	7.2	6.5	1.3	1.7	1.8	1.2	3.1	3.1	2.4	3.0	2.9
South Asia			5.5	4.6				1.2	1.1	1.3	1.5	1.6		1.5	1.5
North Africa/ Middle East	10.0	7.5	7.3	6.4	7.5	6.4	0.3	1.1	0.6	0.9	1.9	1.8	0.8	1.7	1.6
Black Africa	5.5	4.6	5.4	4.6	5.4	4.6	0.1	0.1	0.1	0.7	1.0	1.0	0.5	0.8	0.8
World	5.4	4.6	5.0	4.3	5.0	4.4	100	100	100	100	100	100	100	100	100

Table 49

Growth and distribution of world industrial production in the year 2000

(Scenarios C and D)

Region	Growth rates 1975-2000		Regional distribution of industrial value added in the year 2000			
	C	D	C	D	A (pro memo)	B2 (pro memo)
OECD	2.3	3.3	48.7	49.6	51.4	50.5
North America	2.3	2.4	23.1	18.7	19.3	18.3
Japan	2.6	5.0	5.8	8.5	9.0	10.2
EEC	2.1	3.1	14.9	15.7	15.8	15.9
Others	2.8	4.4	4.9	6.6	7.0	6.1
Eastern Europe	4.4	5.0	24.0	23.0	21.0	23.2
China	5.9	7.3	8.2	9.6	8.0	9.6
Third World	6.4	7.3	19.1	17.7	16.4	16.7
Latin America	7.1	7.8	11.0	10.7	9.4	9.9
East and South East Asia	7.5	7.2	3.6	2.7	3.0	2.9
South Asia	4.1	4.5	1.4	1.4	1.5	1.5
North Africa/ Middle East	7.0	7.0	2.4	2.0	1.7	1.6
	3.4	4.7	0.7	0.9	0.8	0.8
World	3.2	4.4	100.0	100.0	100.0	100.0

Table 50

The pattern of trade in manufactures between developed market-economy countries (A), centrally planned economies including China (B), developing countries (C), from 1970 to 2000, in the various scenarios

Importing areas

Exporting areas

1970	A	B	C	Total
A	51.8	5.3	25.8	82.9
B	3.4	0.9	2.5	6.8
C	8.3	0.9	1.1	10.3
Total	63.5	7.1	29.4	100.0

Scenario A

Importing areas

Exporting areas

2000	A	B	C	Total
A	40.8	7.4	19.6	67.8
B	6.4	1.6	6.0	14.0
C	9.7	2.8	5.7	18.2
Total	56.9	11.8	31.2	100.0

Scenario B2

Importing areas

Exporting areas

2000	A	B	C	Total
A	36.2	8.7	20.1	65.1
B	6.5	1.5	6.0	14.0
C	11.8	3.3	5.8	20.9
Total	54.5	13.5	31.9	100.0

Scenario C

Importing areas

Exporting areas

2000	A	B	C	Total
A	45.2	8.3	10.1	63.6
B	6.9	1.3	6.5	14.7
C	5.3	3.4	12.9	21.7
Total	57.5	13.0	29.5	100.0

Scenario D

Importing areas

Exporting areas

2000	A	B	C	Total
A	23.8	8.4	33.6	65.8
B	6.2	0.6	3.8	10.6
C	15.9	2.7	5.0	23.6
Total	45.9	11.7	42.4	100.0

Table 51

The pattern of trade in machinery and other manufactures between developed market-economy countries (A) centrally planned countries including China (B), developing countries (C), from 1970 to 2000, in scenarios A and B2

Machinery

Other manufactures

Initial situation

Machinery

Importing Areas

Exporting Areas

1970	A	B	C	Total
A	53.2	5.6	34.4	93.2
B	1.1	1.0	2.5	4.7
C	1.6	0	0.4	2.1
Total	56.0	6.7	37.3	100.0

Other manufactures

Importing Areas

Exporting Areas

2000	A	B	C	Total
A	51.2	5.1	21.4	77.6
B	4.6	0.7	2.5	7.8
C	11.8	1.3	1.4	14.6
Total	67.5	7.2	25.3	100.0

Scenario A

Machinery

Importing Areas

Exporting Areas

1970	A	B	C	Total
A	41.9	10.1	32.3	84.3
B	2.8	1.3	5.3	9.4
C	2.3	0.1	3.8	6.3
Total	47.0	11.5	41.4	100.0

Other manufactures

Importing Areas

Exporting Areas

2000	A	B	C	Total
A	40.2	6.2	13.9	60.3
B	8.1	1.7	6.3	16.1
C	13.1	4.0	6.5	23.6
Total	61.4	11.9	26.7	100.0

Scenario B2

Machinery

Importing Areas

Exporting Areas

1970	A	B	C	Total
A	37.0	10.3	35.3	82.6
B	3.1	1.5	6.9	11.5
C	3.1	0.1	2.7	5.9
Total	32.2	12.0	44.8	100.0

Other manufactures

Importing Areas

Exporting Areas

2000	A	B	C	Total
A	36.2	8.1	13.9	58.2
B	7.9	1.5	5.6	15.0
C	14.7	4.7	7.4	26.8
Total	58.8	14.3	26.9	100.0

But before coming to any conclusions, we need more detail descriptions of two different aspects of the future:

- the prospects for industry and the sectoral aspects of interdependence.

- First, we must deepen our understanding of that major phenomenon which has so far been relatively little studied - the world redeployment of industry - and then examine the sectoral problems raised by the growth of world interdependence;

- the crises and breakdowns which may occur as the world economy develops.

- Second, we must reflect on the crises and breakdowns which may occur as the world economy develop over the next twenty-five years, since the developed countries must endeavour to strengthen the chances for promising future development paths and at the same time provide themselves with the means of reducing their vulnerability in the face of uncertainty.

2. THE PROSPECTS FOR WORLDWIDE INDUSTRY

The upheaval of industrial structures is nothing new, but future changes will be distinguished from past changes:

- by the interaction between industry, research and services;

- by the emergence of a new generation of key industries;

- by the occurrence of these changes in a context of slower growth in the developed countries;

- by the extension of industrial interactions to cover the whole world.

As a phenomenon, the coming upheaval of industrial structures is nothing new: it was one of the main features of the postwar period. The expansion of European and Japanese industry has largely been for American industry, what the growth of industry in the Third World now represents for OECD area industry. For two decades industrial policies have been among the principal concerns of the governments of many developed countries such as Japan, France, Italy and Great Britain. In the future, as in the past, technical progress, changes in demand, the relative costs of the various factors, the strategies of the big groups, and government policies, will continue to mould the industrial landscape of regions, states and continents.

How will the changes which are going to affect the growth, organisation and worldwide distribution of industrial production and trade during the next twenty years be different from past changes?

Essentially in four ways:

(1) Interaction between industry and scientific research, and complementarity between industry and many service activities (mainly in the developed countries) are gradually making the concept of industrial activity loose the precise shape that it used to have. As a corollary, in the same countries, industry as a whole is no longer playing the essential role of a creator of employment that it has had over the last twenty years.

(2) A new generation of key industries is gradually taking the place of those which brought about the postwar growth of industry. In the first rank is what may be called the "electronics complex", covering automation, data processing and telecommunications, whose development will increasingly affect the very nature of economic activity, whether in terms of production processes in industry and services, styles of consumption or the role of communications.

(3) The industrial changes in the developed countries will be taking place in a context of slower growth, mainly for the reasons analysed in Part III of the report.

(4) This context of slower growth has arisen at the very time that the system of worldwide industrial relations is subject to pressures of many kinds. The interaction between the industrial forces in North America, Western Europe and Japan is changing, while there is being superimposed on it a broader interaction involving the industries of Southern Europe, the Third World and Eastern Europe. From the "North-West", the framework is extending to cover the whole world.

Some typical trends in the future international division of labour: the fragmentation of production processes and concentration of production capacity at each stage at world level will be accompanied, not only by industrialisation of the Third World, but also by more intense competition between the most developed countries.

Before beginning to examine the prospects for worldwide industry at the sectoral level and in the light of these four main aspects, we may point out a few typical trends of the future international division of labour.

. The slower rate of growth in the developed countries, and the downward trend in the expected profitability of capital, are tending to cause industrial investment to rise relatively in those areas where profitability is highest.

. In terms of what actually happens this trend implies two important kinds of change in production processes: firstly, a fragmentation of processes, which makes it possible to transfer only parts of them to new locations, as the transfer of whole processes may prove to be impossible for technical reasons, ineffective for economic reasons, or impractical for social reasons. Secondly, where the greater concentration of production capacity at each stage involves the extension of markets to cover the whole world, it permits full exploitation of economies of scale.

. The phenomena of specialisation within individual industries which have been a feature of the growth of industrial output and trade in the most developed countries over the past twenty years will extend to the Third World countries and to some extent to the Eastern countries.

. We are likely to see more intense competition between the most developed countries to control the trend of the new international division of labour at the level of technology and of their own productive system.

. A tendency for increased State intervention (direct or indirect) in the processes of internationalisation of production and commercial competition, and in the consequences of these processes on the social and economic management of the national productive systems.

These various trends can be illustrated in concrete terms by the long-term sectoral prospects:

. The twofold trend towards concentration and fragmentation is becoming clear in the development of the electronics and automotive industries. It is also significant that in both these cases the dividing line between the actual industry and services in the advanced countries will tend to be less clear than in the past, in particular, research and design activities will develop in parallel with the process of internationalisation.

. The extension to certain Third World countries, and to some extent to Eastern countries, of the growth of specialisation within individual industries, will particularly affect the capital goods sector (electrical and engineering industries) of which a characteristic feature is large internal flows.

. At the same time there will be a tendency in this sector for technologies to become more homogeneous, but this trend should not conceal the tendency towards oligopoly in the most advanced countries. In the most competitive areas it is the key technologies which determine the trend of production processes and improvements in work organisation that are secondary. The mastery of these technologies, which commonly contain interacting elements of electronics and engineering, will undoubtedly be one of the major issues between the most advanced countries.

Four groups of industries illustrate the reality and diversity of the probable development:

- *electronics and capital goods;*
- *motor vehicles and chemicals;*
- *shipbuilding;*
- *iron and steel.*

Four groups of industries will be used to exemplify and clarify the actual nature of the phenomenon more clearly:

. Firstly, electronics and capital goods: these are industries which will be playing an increasing part in the industrial structure of the developed countries.

. Motor vehicles and chemicals, two examples of industries which have been one of the main driving forces in the industrial growth of OECD countries but are on the brink of large-scale changes.

. Shipbuilding, as it illustrates, together with textiles(1), the situation of large traditional industries in the developed countries.

. Iron and steel, a particularly important case of a basic industry(2).

(a) Expanding sectors: electronics and capital goods

Electronics

The electronics complex during the next quarter of a century will be the main pole around which the productive structures of the advanced industrial societies will be organised.

Through its links with data processing and telecommunications, the introduction of automation throughout industry, the changes which electronic office equipment is producing in service activities, and the actual services which it creates, the electronics complex during the next quarter of a century will be the main pole around which the productive structures of the advanced industrial societies will be reorganised.

The signs are already present. Electronics has been one of the most rapidly expanding sectors throughout the world during the last decade, with a growth rate of physical output of more than 10 % per annum between 1965 and 1975. At the present time, among the main producing countries, the share of this sector in total industrial production is approaching that of the car industry. On the other hand, its share of industrial employment is appreciably less because of its comparatively high productivity.

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(1) The case of textiles was discussed in Part IV in connection with North-South relations, because it assumes its full significance mainly in this context.

(2) The sector analyses are those of INTERFUTURES and not those of the OECD Working Parties which specialise in these sectors.

It is reasonable to suppose that in the next decade, even if the rate of growth of the sector slows down somewhat, it will still be substantially faster than that of the manufacturing industry as a whole. Thus in a growth context such as that illustrated by Scenario A, the annual rate of growth of the electronics industry worldwide up until 1990 might be of the order of 8 % compared with approximately 5 % for the whole of the manufacturing industry. Moreover, this rate would be only slightly lower in Scenario B2 or Scenario B1, first because many electronic devices are replacing others and thereby altering the characteristics of existing products, and secondly because electronics can supply many goods and services which can meet demands arising in a "new growth" context.

The importance of the electronics industry, the part which it may be called upon to play in transforming productive structures (not to speak of its impact on social structures) and the commitment which it represents for the main producing countries, are far from being reflected in the figures of growth, production shares or employment, however spectacular these may be.

Table 52

Turnover and employment in the electronics sector in the main producing countries, 1975-1976

	USA	Japan	Germany	France	UK
Turnover 1975(1)	39.6	14.2	11.1	7.9	7.07
Employment 1976(2)	1142	600	410	256	489
Proportion of total industrial employment 1976(3)	4.5	3.3	3.6	3.3	5.0

(1) In billions of 1975 US dollars

(2) Thousands

(3) Percentage

Three subsectors traditionally make up the electronics industry: basic components; capital goods for industry,

In order to understand its importance, and to try to assess the possible consequences of the medium and long-term evolution of the electronics industry, it is necessary to distinguish the three subsectors which traditionally make up the industry: basic components; electronics capital goods used in industry, services and government; household appliances and equipment.

services and government; and household appliances and equipment.

This breakdown makes it possible to discern the characteristic features of future technological competition between the main producing countries; state the nature and limits of the probable geographical transfers in the Third World; assess the amount of influence which the electronics industry will have on the other sectors; and measure the importance of the multinational firms in tomorrow's developments.

place mainly in the field of the basic components and associated software, ...

One of the essential factors in the dynamic nature of the electronics industry - present and future - is the rapidity with which a technical innovation may have tangible effects on the market in a form of a product and/or production process. Innovation takes place mainly in the field of the basic components and associated software. This fact illustrates the nature of the competition in the industry, which will intensify between the main producers with a sufficiently large market and ready to devote a large R&D effort to their components industry.

The growth of the components sub-sector, the strongest in the sector, is concealed statistically by a phenomenon which will also probably become more marked: the integration of that activity in the firms producing capital goods.

... but it is in the capital goods sector that the electronics industry will have the greatest impact, ...

Developments in the electronics industry will undoubtedly have the greatest long-run impact on the capital goods sector. The production of automatic control equipment (taken in isolation or forming an integral part of "automated capital equipment") is of strategic importance because the mastery of the appropriate techniques is increasingly becoming an essential condition in most industrialised countries for the attainment of objectives substantially beyond the traditional mechanisation of industrial activities and services. Such targets may be grouped in five large families:

- Increases in productivity in the wider sense (reduction of the work force; increases in output per unit of time; greater flexibility in the productive system with the possibility of changing quickly from on type of manufacture or rate of output to another).

- Improved and more consistent quality of products, with lower quality control costs.

- Mastery of increasingly complex operations by greater use of automatic process control.

- Transformation of working conditions and environment.

- Lastly - and this is not the least important objective - greater flexibility in the international siting of industrial activities thanks to the possibility of dividing up the various stages while maintaining technological mastery of the whole production process.

... whereas in the case of household goods, electronics will change the design of existing goods before developing new generations of goods.

The successive reductions in costs which have resulted from the introduction of electronics in household goods are the basis of the rapid growth of output of these goods. But the impact of electronics has mainly affected existing goods by changing their design, and generally has not led to the development of really new products. The idea of a market saturation in the developed countries which would be only partially offset by the reduction in costs therefore cannot be rejected in the medium term. In the longer term, however, the new prospects offered by the markets of the developing countries, and the introduction of new generations of consumer goods actually created by electronics in the fields of leisure, health, education, information and communication might bring about renewed expansion throughout the whole household goods sector.

To sum up, the structure of world demand is likely to change appreciably during the next 10 years, to the detriment of household goods and to the benefit of capital goods, as is shown in Table 53. The situation after the 1990s is much more uncertain, and depends on the creation and acceptance of new generations of mass consumption goods by the upper- and middle-income markets, and the systematic adoption of automated capital goods in production processes on a worldwide scale.

Table 53

Structure of demand in the electronics industry worldwide 1970-1985 (%)

	1970	1975	1985
Total demand (1)	56.8	91.3	204.8
Consumption	20.7	19.0	17.4
Industry and private services	30.5	39.2	45.4
Administration (2)	48.8	41.7	37.2
Total	100.0	100.0	100.0

(1) In billion current US dollars

(2) Including military demand and communications systems

The concentration of the greater part of consumption in OECD countries is likely to be maintained over the next fifteen years.

At present, the consumption of electronics products is very largely concentrated in the developed countries. According to some statistics, OECD countries accounted for 78 % of world demand in 1970. Excluding the centrally planned economy countries from the calculation, the five main producers (United States, Japan, Germany, France, Great Britain) alone absorbed 81.4 % of total output in 1975. While it will tend to gradually disappear, this preponderance of the Northern markets is likely to be maintained over the next 15 years.

This concentration of consumption is more than matched by the concentration in production, the five main producers accounting in 1975 for 85.5 % of total output (Table 54).

Table 54

Geographical structure of production, consumption and employment in the electronics industry - 1975

	Consumption	Production	Employment
Five main producing countries	82.1	85.5	75.2
USA	54.8	41.2	29.7
Japan	11.2	15.6	16.7
Germany, UK, France	16.1	28.7	28.8
Rest of the world (excluding centrally-planned economy countries)	17.9	14.5	24.8
Total	100.0	100.0	100.0

Production will be marked:

- *by a twofold movement towards integration (downstream by the designers and producers of components, and upstream by the producers of mechanical and electrical capital goods);*
- *by competitition between United States, Japanese and European firms.*

In the context of the growth of the electronics industry, and taking into account the changes we have already mentioned concerning the structure of demand by type of user, what are the main trend which could affect the future geographical structure of employment and production by type of product? Beyond this question there is another, which enables us to measure the scale of the conflicts which will be taking place around the electronics industry: how will the trend of competition between the main producers and exporters of automated capital goods influence the international division of labour in industries whose production processes are most sensitive to the introduction of such types of equipment?

Three technological phenomena have to be considered to assess the circumstances of this competition:

- The process of innovation is becoming increasingly costly, especially in terms of capital, while investment in research, not connected with any immediate profits, is tending to decline in the electronics firms. State participation seems to be increasingly necessary.

- The basic technologies which have made possible the development of increasingly efficient integrated circuits (LSI, VLSI) seem bound to reach their limits in the next decade, and the basic research effort needed to develop new technological generations will be all the more considerable.

- As the techniques applied to components reach their physical limits, the technological factor will affect the conception of materials (automatic systems, automated capital goods) and the design of the system.

Tomorrow will therefore see a *twofold movement towards integration*. *Downstream*, by the designers and producers of components who will try to invest more in design and manufacture of materials (down to consumer goods); and by the producers of the automatic control systems which will be incorporated in capital equipment. *Upstream*, by the producers of mechanical and electrical capital goods who will try to cross the "electronic threshold" by developing an automation activity and even integrating as far as components.

In this situation, freedom from technological dependence on one of the three poles (North America, Western Europe and Japan) will have to be based on mastery of the components sector and on a structure for the capital goods sector which makes it possible to rapidly incorporate electronic innovations into electrical and mechanical engineering. The conditions are closely connected: the quality and competitiveness of electronic equipment will largely depend on the aptitudes acquired in the processes of designing and producing components; while the efficient use of automated capital goods will similarly depend on the aptitudes acquired in producing them. The countries or regions best placed will be those having a large market for capital goods, and in which the process of integrating activities from R&D to the actual construction of the equipment has been taken the furthest.

How do the positions of the United States, Japan and the European countries appear from this standpoint?

. The *United States* has an undeniable superiority in component technology. Even allowing for the very ambitious Japanese programme for the most highly developed integrated circuits (VLSI), their firms have considerable room for manoeuvre in view of their size and internationalisation. One American firm alone has an R&D investment plan comparable to the whole Japanese programme for VSLI. As for the internationalisation of production (which mainly concerns the last labour-intensive stages of the production of integrated circuits) it is enough to recall that in 1974 American firms were employing 72 % of all employees of multinational firms in the semi-conductors sector in the developing countries - far more than Japan and Europe.

An indication of American preponderance is given by Table 55 concerning the world market for semi-conductors.

Table 55

World market for semi-conductors
(excluding centrally-planned economy countries)
in 1976 and 1980 (estimate)

		USA	Europe	Japan	Rest of World	Total	
		%	%	%	%	%	millions of US $
Consumption	1976	45	25	23	7	100	5400
(of which integrated circuits)		(52)	21	(23)	(4)	(100)	(2800)
Consumption	1980	44	25	26	5	100	
Percentage of market controlled by firms originating in each area	1976	61	17	21	1	100	5400
(of which integrated circuits)		(71)	(9)	(20)	(-)	(100)	(2800)
	1980	66	10	21	1	100	

Japan has a very consistent medium- and long-term programme for industrial electronics.

. Japan is undoubtedly the country with the most consistent medium- and long-term programme for industrial electronics, ranging from components through automated control systems to capital goods. The Japanese Government has undertaken to provide approximately thirty billion yen over a four-year period from 1976 to 1979 to finance the design programme of VLSI for applications in data processing. While Japan is still dependent for certain basic high-technology products needed for the manufacture of components, all the indications are that this dependence will be eliminated before 1985. The strength and consistency of the Japanese programme lies essentially in the fact that work upstream in the components field produces very rapid results at the level of automated capital goods, in particular by the intensive use of numerical control in machine tools and, more recently, the large-scale development of microprocessors (90 % of the new models of numerically-controlled machine tools are equipped with them). Japan's present leadership in the robot industry is a particularly significant illustration of this aspect (more than 50 % of the robots at present in service are Japanese).

The experience and the lead of Japan and the United States in this area might in time lead to differential increases in productivity (especially in comparison with Europe) that would be most marked in the industries using the equipment. In the electronics industry itself the Japanese firms at present have a lead in the automation of production and are thereby well placed to take competition into fields other than that of the search for cheap labour. At present they seem to be starting to move out of the developing countries, a movement that favours a foreign investment strategy based on subcontracting and participation rather than on the creation of wholly-owned subsidiaries as preferred by the American firms.

For Western Europe as a whole the prospects appear less favourable, varying widely from country to country.

. For Western Europe as a whole, or EEC taken alone, the prospects appear less favourable. In 1970, 50 % of the European semiconductor market and 72 % of the integrated circuits market was supplied by American firms (either by exports or through their European subsidiaries). There are a number of factors which explain this situation:

- Firstly, the national fragmentation of the European markets for components, which incidentally in total only account for 25 % of the world market, compared with the homogeneous American market, with 45 %. This factor prevents European firms from benefiting to the same extent from some important advantages: economies of scale, mobilisation of resources for R&D, and exploitation of relative international advantages in terms of manpower.

- Secondly, the European firms have tried, because they are few in number, to offer a very wide range of components, thus dispersing their R&D efforts. With a few outstanding exceptions, therefore, they are behind in some key technological areas (raw materials for components, elaborate integrated circuits), and this has repercussions in the control equipment sector. Against this background what are the prospects for European industrial electronics?

For several reasons, Germany seems to be the country best placed both form the standpoint of components and from the level of automation. It has an aid programme for R&D on integrated circuits which is undoubtedly the most far-reaching and ambitious in Europe. The programme is designed to achieve technological independence and competitive ability in VLSI. But above all, it is the powerful capital goods industry with close links with the electronics industry which will probably enable Germany to develop automatically-controlled capital goods, microprocessors and numerically-controlled machine tools very rapidly.

In comparison the prospects for France and Britain appear to be more limited, with less work being done on components and integrated circuits, and a lower level of integration between a less dynamic capital goods industry and the electronics industry. The tendency is thus not towards more or less total technological independence so much as towards strengthening design and production capacities in order to be able either to develop all the technological innovations available on the market or to occupy key positions in very specialised equipment.

In the long run the following scenario seems a fairly likely one:

- The European position strengthens in the production of components or straightforward integrated circuits. This does not exclude, for certain countries, the continuance of some dependence on American technology.

- The European firms make a limited penetration in some very specialised high-technology electronic equipment, which might be based on participation in medium-sized American firms.

- The German position is consolidated in Europe, Germany becoming the only country able to develop industrial electronics on all fronts, from the raw materials for components to automatically-controlled production equipment.

Technological competition between the main producing countries will largely determine in what way and to what extent the Third World will be integrated in the production of, and trade in components and household goods.

The characteristics of the technological competition between the main producing countries illustrates the trends of specialisation which are going to affect the international division of labour for automated production equipment. In what way, and to what extent, the Third World will be integrated in the production of, and trade in components and household goods has still to be made clear.

For electronic goods as a whole, the proportion of those for which the siting of production is not connected with either strategic or technical or market factors has been estimated at some 30 %. In the future, that order of magnitude is likely to remain steady or even diminish. The factors which have been contributing since the 1960s to the large-scale transfer of a part of the production of electronic equipment to certain Third World countries are well known. Initially it was competition between the multinational firms in the matter of costs. This led to the development of production processes whereby those parts not calling for skilled manpower could be hived off and established in low-wage, high-real-productivity countries. Special tariff arrangements (duties on imports by the developed countries levied only on value added) accelerated these transfers. At the present time, the transfer phenomenon mainly affects South-East Asia (Taiwan, Hong Kong, Korea, Singapore), Latin America (Brazil and Mexico) and to a lesser extent the peripheral European countries(Portugal, Spain, Greece, Ireland, Yugoslavia). Some figures: between 1967 and 1974, exports of electronic components from the developing countries to the developed countries expanded by 69 % annually; for television receivers the rate was 97 %; and in 1974 the share of the developing countries in the total imports of the developed countries was 29 % for components and 17 % for television receivers. (The same countries accounted for 88 % of United States imports of semi-conductors). Naturally, virtually the whole of these imports consist of intra-firm trade.

What may be the long-term trend in this development?

. The process of redeployment towards the Third World is likely to continue in the next decade, though at a slower rate. The transfer of standardised production processes is no doubt only an intermediate stage, since in order to meet the competition from the developing countries which they have themselves brought about, the industrialised countries have two advantages: technological innovation making more extensive use of automation; and the creation of products very closely linked to market characteristics.

. There are three locational tendencies: first, for activities requiring high technological capacity, or for which the production processes can be largely automated, to be increasingly concentrated in the most developed countries; secondly, for straightforward products or activities involving high manpower costs, to be transferred as in the past to new areas in the Third World (Philippines, Malaysia, Caribbean); and lastly, a more or less independent development of production capacity and even design for mass consumption products in the intermediate countries which already have a domestic market and some technological capacity (Republic of Korea, Taiwan, Brazil, Mexico, India).

Electronics will revolutionise the automation process in many industries, whether they produce intermediate goods, capital goods or consumer goods.

Because of the abrupt improvement in quality represented by the appearance and spread of the use of micro-processors, electronics will revolutionise the automation process in many industries: the consequence of this for the trend of employment, in terms of its volume and the pattern of skills, were referred to in Part III of the Report, but the impact on international competition in industry will be no less important.

- For the industries producing intermediate goods (steel, non-ferrous metals, chemicals, etc..) involving continuous processes, electronics may make it possible to increase productivity by improved control over the whole process. The countries best placed to exploit these gains are those with the highest degree of integration between engineering, process control engineering, and construction of equipment. As the changes will come about gradually, however, automation should not upset the position of the industrialised countries in relation to each other. They are, on the other hand, important for the Third World, as it may be difficult for some developing countries to maintain complete production units using automated control systems. The multinational firms may see this as a guarantee for their investment, whether they are units for processing raw materials of mineral origin, or highly automated units for supplying local markets. There is no need to emphasise that such trends are not favourable to employment in the Third World.

- For the industries producing capital goods, which mainly rely on series of processes, the widespread use of micro-processors and numerical controls will change both the design of products and the production methods. It will result in two complementary tendencies:

. A tendency for a more important part to be played by the manufacturers of elaborate components, with integration between them and the producers of capital goods. Along with simplification of the production processes in the sectors utilising these goods will go greater complexity at the level of the sectors producing them, which will encourage concentration of production of the most highly automated capital goods among the few countries and firms which can master the upstream end of the production process.

. Development of the design and manufacture of increasingly specialised capital goods, in markets that are narrow from the point of view of the field of utilisation and wide in their geographical distribution.

In these circumstances, international competition will be dominated by a few countries, mainly the United States which is indisputably in the lead, and also Japan and Germany.

- For the industries producing consumer goods, which are relatively labour-intensive, automation will affect both the volume of employment needed and its structure in terms of skills. Two different methods of automation must however be considered: the first consists in replacing human labour as far as possible by machines (this is the case in some Japanese car plants and some German textile plants), and the second, in rationalising the organisation of work by improved control and new allocation of tasks (progress is then the result less of the design of the automatic controls themselves than of the software). The most likely assumption appears to be that the second method will gradually spread under the simulation of the producers in the industrialised countries. Allowing for the slowdown in demand, the effect on employment will be negative in the developed countries. So far as the international redeployment of activities is concerned, there will no doubt be a twofold trend:

. the transfer to rapidly expanding developing countries and to the least developed industrialised countries of the production of consumer goods requiring unskilled labour and highly automated processes;

. increased division of labour between the developed countries themselves within individual industries, in order to exploit the economies of scale at the level of increasingly small subdivisions of the technical processes.

Innovation becomes more important here, just as in the other sectors, as automation extends and as production is internationalised.

As shown in Part III in relation to the types of social organisation found in the OECD countries, the electronics complex is thus clearly at the heart of the future industrial relations between the developed countries. A description of its links with the capital goods industry will make it possible to present that sector more succinctly.

Capital goods

Capital goods production is a sector of increasing importance in terms of value

In 1970, for a worldwide value added in capital goods of some $ 300 billion, the share of the market economy developed countries was of the order of 61 %, that of the centrally-planned economy countries 36 %, and that of the developing countries 3 %. For investment goods *added, industrial employment and developed-country exports.*

alone, the share of the Third World was only 2 %, almost four-fifths of this being concentrated in five countries: Brazil, India, Argentina, Mexico and the Republic of Korea (Table 56).

Apart from the very unequal distribution of activities throughout the world, this sector has two other characteristics: its growing importance in terms of value added and industrial employment (Table 57) and its increasing share in international trade. Thus in 1974, trade in investment goods accounted for nearly 40 % of total trade in manufactures, one-half of this coming from the group USA-Germany-Japan.

Table 56

World distribution of value added and employment in the capital goods industry in 1970

	Value added		Employment
	US $300.5 billion		27.8 million
of which (%)			
Market economy developed countries	60.9		57.9
USA		29.8	
Japan		9.7	
Germany		6.6	
France		3.7	
UK		4.7	
Centrally planned economy countries	36.0		36.5
Developing countries	3.1		5.6
Latin America		2.0	
Asia		0.95	
Africa		0.15	
Total	100.0		100.0

Table 57

	Proportion of capital goods in value added by manufacturing industry		Share of engineering in employment and manufacturing industry	
	1960	1974	1962	1973
USA	38.1	42.7	21.0	23.7 (3)
Japan	31.7	48.5	18.3	23.6
Germany	38.2	39.0	28.1 (1)	30.0
France	37.3	39.2	19.1	23.4
United Kingdom	41.1	40.5	24.3 (2)	23.7
Italy	29.9	36.5	16.5 (2)	22.0
Brazil	9.2	14.5	8.1	12.7 (3)

(1) 1966 (2) 1967 (3) 1972

Table 58

Share of exports of capital goods in total exports and in production of capital goods

	Total exports		Capital goods production	
	1965	1975	1964-66	1974
USA	36.8	42.5	6.2	9.9
Japan	31.3	49.2	14.9	22.5
Germany	46.2	46.5	37.4	46.4
France	26.3	33.0	16.1	23.1
United Kingdom	42.0	41.8	21.9	27.4
Italy	30.2	35.0	36.0	41.0

To try to identify the future prospects in this sector we shall deal with the problems arising in the developed countries, between those countries and between North and South; the factors which determine production and trade; and lastly the magnitudes suggested by the studies that have been made.

What are the future prospects in this sector? To try to distinguish them we shall deal in turn with the problems arising in the developed countries, between those countries, and between North and South; the factors which determine production and trade; and lastly the magnitudes suggested by the studies that have been made.

Part III stressed the importance for the developed countries of the volume and composition of investment in a context in which the increase in productivity achieved with additional capital appears to be tending to diminish, at the same time as the trend of work structures is tending to increase the overall capital-intensiveness of the economy. The search for profitable investments then becomes largely a matter of developing new systems of capital goods, and increases in overall productivity will largely be derived from the capital goods sector and particularly from the subsector of capital goods producing the machine tools and control systems used in the manufacture of other capital goods.

There will be keener competition between developed countries.

This trend will probably stimulate competition between the most developed countries, and especially between those with the most advanced technology, since it is that technology which is increasingly tending to be incorporated in certain types of capital goods. The competition will affect, inter alia, exports to the Third World, as the expansion of such exports is the inevitable counterpart of an increase in imports of manufactures, raw materials and energy. It will play in an increasingly essential part of the terms of contracts negotiated in addition to prices, and including payments facilities, compensation agreements, etc..

The Third World countries will have difficulty in setting up autonomous capital goods industries.

The needs of the Third World countries in capital goods are considerable, but several factors, such as markets that are becoming worldwide, will make it difficult for them to set up autonomous capital goods industries. There are three possible ways in which they can meet this difficulty: by negotiating participation or sub-contracting agreements in the high-technology sectors (such as electronics) or those with a very oligopolistic structure (such as electrical equipment); by developing production capacity for capital goods on the basis of imports of investment goods when the size of the local markets makes this possible; and by operating outside the world market, with the production of less sophisticated equipment.

The demand for capital goods will increase faster than gross domestic product,...

The elasticity of demand for capital goods in relation to gross domestic product appears to be tending to increase:

. In the developed countries, most of the industries making the biggest contribution to demand for capital goods (electrical and mechanical engineering, chemicals, energy, metals) are likely to have an overall growth rate higher than the average for the whole industry.

. In the developing countries, demand comes from the basic industries, mining and agriculture, and for the other industries, from production units that have been transferred from other countries.

. Lastly, substitution of capital for manpower in the private and public sectors is tending to increase.

...but the structure of supply will have a considerable influence on the development of the market.

Supply will also play a decisive part in the development and and diffusion of technology. The case of machine-tools is a particularly good illustration of this: the gradual introduction of numerical control, modular co-ordination, and automatic process control systems is bringing about such a revolution in the conditions of production that there are almost no applications for which those who can handle these techniques do not thereby obtain decisive advantages over those who cannot. With 70 % of the production of numerically-controlled machine-tools in the OECD countries, Japan, the United States and Germany are those best able to influence the norms and the trend of productivity.

Structure of supply? There are three tendencies:

. In those sub-sectors which have very concentrated markets (energy, heavy engineering, basic industries), the very large national firms are playing an increasing part with vertical and horizontal integration; while at the world level an oligopolistic structure persists, based on a certain degree of protection of national markets and the existence both of cartels and of government support for exports.

. In the mass-market sub-sectors, activity is increasingly concentrated in the multinational firms because of their ability in the fields of marketing, innovation and worldwide organisation of production.

. At all levels, there is increasing specialisation within each industry.

In the long term, there will undoubtedly be structural changes in trade in capital goods under the threefold influence of technical progress, the behaviour of the multinationals, and government action.

After what has been said about electronics, the role of technical progress is clear, but the importance of the two other factors deserves to be emphasised:

. The multinational firms have shown, and will continue to show, remarkable flexibility in adapting to the industrialisation strategies of the developing countries. Under the protection of trade barriers they began by establishing significant centres in the Third World. In Mexico in 1970, out of the 290 largest firms producing capital goods, the multinationals controlled 87 % of mechanical engineering and 82 % of electrical engineering. In Brazil in 1972, out of the 300 largest capital goods firms, the corresponding figures were 74 and 78 %. At the present time it is their subsidiaries which are the most able to benefit from the export promotion measures taken by the governments of the developing countries.

. Intervention by the governments of the developed countries will doubtless continue to increase: financing of R&D accompanied by increasingly binding directives as to priorities for research and product definition (the State being an important buyer), official or hidden participation in negotiations on the restructuring of firms, and support for exports. A significant example is that of exports of turnkey plants. In Japan from 1970 to 1976 the annual increase in sales of such plants was 35 % by value compared with 24 % for that of machinery sales; and in France, the ratio of exports of complete plants to those of capital goods increased from 8.2 % in 1971 to 25.3 % in 1974. Suppliers' and buyers' credits are increasing at a parallel rate. Thus in Japan in 1976 suppliers' credits amounted to 73 % of the value of exports of plant. A large part of these credits originates from institutions, and their terms are often a major factor in the choice of supplier.

As in the importing developing countries -whether or not they have a market economy - the size of the contracts makes their governments the main if not the only negotiators, these governments try to negotiate with their opposite numbers in the developed countries, or at least to obtain guarantees from them. This has two consequences: (1) political relationships will play an increasing part in competition in the international markets for capital goods; and (2) intervention by governments in trade promotion will tend to strengthen their financial and industrial role.

The annual growth rate of this sector worldwide is likely to be between 5.4 per cent in Scenario A and 4.6 per cent in Scenario B2, the OECD area's share falling to about 60 per cent by the end of the century.

What may the quantitative consequences of these changes be? They are fairly well described by the scenarios that have gone before.

Between now and the end of the century, the annual rate of growth of this sector worldwide is likely to be between 5.4 % in Scenario A and 4.6 % for Scenario B2 (excluding the unlikely breakdown scenario which, despite a high rate for the Third World, implies a figure below 4 % worldwide).

The share of the developing countries (excluding China) in world production will probably be approximately 13 % in the year 2000. This is quite a reliable result because it varies little from Scenario A to Scenario B. Only the breakdown scenario results in approximately 16 %, a figure not far from that of the UNCTAD and UNIDO exercises in their evaluation of the consequences of the Lima Declaration.

With the Eastern countries also increasing their share, the OECD area percentage falls from 75.4 % to approximately 60 %, a fall which should not cause us to overlook the fact that technological control is retained.

Lastly, in the developed countries, the Japanese lead is likely to continue, with the German share falling slightly and that of the United States declining from 31 % in 1970 to approximately 18 % in the year 2000.

(b) Industries which have been pacesetters in past growth

The automotive industry

Over the next quarter of a century the automotive industry in the developed countries will undergo a considerable upheaval. The trend of demand and changes in comparative advantages will oblige the car manufacturers to adopt adjustment strategies which will change the worldwide distribution of activities in the industry.

This industry accounts for a substantial part of total industrial production, value added and investment in the eight countries which are the main producers - the United States, Japan, Germany, France, the United Kingdom, Italy, Canada and Sweden. From 1969 to 1973 the three percentages are respectively 8.6, 6.4 and 6.1 in the United States; 7.9, 5.5 and 7.6 in Japan; and 8, 7.5 and 9.7 in Germany. The numbers dependent on the industry for employment are considerable: 900,000 employed directly and 1.7 to 1.9 million indirectly, in Japan. Lastly, the industry plays an essential part in exports of industrial goods (15 % in Japan and 10 % in Great Britain in 1974).

Over the next quarter of a century, the car industry in the developed countries will undergo a considerable upheaval. Despite increases in production and even if private cars remain a favoured means of transport, it may be difficult to maintain direct or indirect employment at their present levels.

The trend of demand and changes in relative advantages will oblige the car manufacturers to adopt adjustment strategies which will change the worldwide distribution of activities in the industry.

The share of world demand for vehicles represented by the markets of the traditional producing countries will fall heavily.

In the developed OECD countries the stock of passenger cars is gradually approaching saturation point. The level at which this might be reached differs considerably from one region to another depending on the population density, attitudes towards cars, the other means of transport that are available and government policies: from 500-600 vehicles per thousand capita in the United States to 400 in Western Europe and 300 in Japan. The rate of growth of demand will gradually fall in consequence until it will be practically nil towards the end of the century in North America, Japan and Central and Northern Europe. By 1990, replacement demand will account for 85 % of the total demand of all these countries. The only exception will be the countries of South Europe (outside the EEC) whose present rate of motorisation is less, and whose stocks of passenger cars will increase by approximately 10 % per year until 1985, the rate then falling off gradually to 3 % at the end of the century.

Thus, even in the high-growth Scenario A, the long-term prospects for demand for passenger cars are fundamentally different from what they have been over the last 20 years. They are less good in Scenario B2, in which low growth may prolong the life of vehicles, and in Scenario B1 where the role of public transport is likely to increase.

The situation is more complex where commercial vehicles are concerned, the demand for which depends on the level of economic activity, the regional and sectoral structure of the economy, the existing infrastructure, and the regulations in force, but in any event the change in the content of the national income (even in Scenarios A and B1) and the slowdown in growth will have unfavourable effects on demand for these vehicles in the developed countries.

From this follows the major consequence already mentioned in the study on North-South interdependence: the share in world demand for vehicles represented by the markets of the traditional producing countries will fall heavily.

The few figures in Table 59 show the order of magnitude of this phenomenon.

It must be added that the importance of replacement demand which can easily be postponed will make the automotive industry increasingly sensitive to fluctuations in the level of economic activity.

How might the car-producing groups respond to these changes?

The car-producing group's adjustment strategies will involve: a gradual transfer of production to regions in which demand is growing faster; a search for new technologies adapted to new regulations or new attitudes of users; greater efforts to improve productivity; gradual diversification of activities.

The adjustment strategies will probably have four main components:

. A gradual transfer of production of regions in which demand is growing faster: the periphery of Western Europe, South Europe, Latin America, and some Asian countries. There are now assembly plants in 86 countries, compared with 55 in 1966. Tomorrow the local content in national production will be increasing steadily. In Venezuela, for example, where it was 35 % in 1976, it is likely to reach 90 % by 1985.

. A search for technologies adapted to new regulations or new attitudes of users (savings in energy and raw materials, limitation of pollution and noise, reduced risk of accidents, etc..).

Reductions in the weight and size of vehicles, improved aerodynamics, and the development of more efficient engines, are likely to reduce fuel consumption substantially. This is especially true of the United States, where a study by the Department of Transport forecasts that consumption of motor fuel is likely to be only 80 % of its 1975 value by 1990. At the same time, purification equipment will be installed and non-polluting engines will be developed to meet stricter control of emission. All these technical changes will be in the direction of increased costs.

. Greater efforts to improve productivity and maintain international competitiveness. The development of automation, unification of models, sharing of work between the companies of a single group, concentration of production of a specific piece in one plant, transfer of certain operations to low-wage countries, joint production of certain components with competitors, and take-over of the samllest producers, are all aspects of the drive to reduce costs.

Table 59

Trend of demand in the car industry

(i) Share of the various regions in growth of world stock of motor vehicles (%)

Region	Passenger cars		Commercial vehicles	
	1960/1976	1976/2000	1950/1976	1976/2000
OECD developed countries	83	31	72	35
Less developed European countries	4	8	3	4
Eastern countries	5	25	9	17
Rest of the world	8	36	16	44
World total	100	100	100	100

(ii) Total demand for passenger cars

Region	Number (thousands) 1974	Percentage of world demand	Number (thousands) 2000	Percentage of world demand	Percentage of replacement demand in 1990
North America	11273	41.0	13500	23.7	84.8
Western Europe	9498	34.6	14900	26.1	87.8
Japan	2670	9.7	4400	7.7	84.3
World	27477	100	57000	100	75.0

(iii) Demand for commercial vehicles (millions)

Region	1976	2000
North America	28.4	43.0
Western Europe	10.5	26.0
Japan	10.9	16.0
World	67.1	164.0

. Gradual diversification of activities. The best example of this is the FIAT group, only 50 % of whose turnover will be in motor vehicles by 1980.

The above-mentioned factors and the trend of demand will change the geographical distribution of the automotive industry.

The above-mentioned factors, combined with quantitative changes in demand, will bring about a considerable relocation of the industry.

The share of North America in world car production has been falling constantly over the last 20 years. This situation could be explained in the past by a low rate of growth in domestic demand, foreign competition and limited exports. The future might be appreciably different, although with no actual reversal of the trend: a change in the characteristics of American cars might help exports and reduce imports. The European and Japanese producers might well tend to produce in North America in view of the smaller difference in wages, the size of the market, the level of rates of exchange and the risks of protectionist measures, at least ot the extent that an increase in labour productivity will be possible in North America.

In Western Europe, the spectacular growth of the automotive industry in the recent past has been the combined result of the expansion of the domestic market, remarkable export performances, and the weakness of competition. None of these factors will apply in the future: domestic demand will increase slowly; the prospects of exports to the United States, Japan and Oceania will be limited, and the same will be true of many developing countries, while the volume of imports on the European market will increase, especially from Japan, the Eastern countries and to a lesser degree some of the developing countries. Serious difficulties may thus be expected to arise for the traditional producers in their traditional locations. The production prospects are favourable only for Spain and the peripheral European countries.

From the end of the 1950s to the beginning of the 1970s, Japanese production of passenger cars rose by 30 % annually and that of commercial vehicles by 15 % annually. In future the domestic market will grow much more slowly and imports will expand considerably. According to a forecast in the 1978 edition of "Japan's Industrial Strucutre: A Long-Range Vision", imports of passenger cars might total 250,000 in 1985. Exports will therefore play a big part, but in the developing countries they will gradually be replaced by local products; in the United States it will undoubtedly be difficult for Japanese producers to increase their share of the market; there remains Western Europe and the EEC in particular, but too great a Japanese penetration may encounter protectionist measures.

In East Europe, government policies have slowed down the development of the domestic markets. These will nonetheless continue to expand but will be supplied exclusively by the output of the region. Exports of cars are regarded as one of the priority ways of obtaining foreign exchange. Thus the figure of 200,000 passenger cars exported in 1976 will expand to 440,000 in 1985, of which 300,000 will be destined for Western Europe. At that time total vehicle production (including commercial vehicles) in Eastern Europe is likely to have risen from 2.9 million in 1976 to 6.2 million in 1985 or from 7.5% to over 10% of world production.

Part IV of this report has already stressed the growing part to be played by the automotive industry of Latin America. Exports are heavily subsidised there. Latin American products are already competitive in Africa (Nigeria, Zaire, the Republic of South Africa) and the Middle East (Iraq, Kuwait, Saudi Arabia), one of the reasons being the reliability of vehicles built for poor road conditions. Engines and components made in Latin America are exported in large numbers to Europe and the United States for fitting to vehicles destined for those markets.

In the last decade of the century the automotive industry might confront governments of developed countries with serious problems.

This short survey indicates the extent of the future problems: a possible reduction of employment in the developed countries, especially the EEC, more intensive competition between Japanese, European and American producers, transformation of producing groups into genuine multinational co-operations. In particular, difficult negotiations are to be expected, the main participants being governments, companies and trade unions. The dangers of protectionism (especially through the device of standards),or of specific export promotion measures, are far from negligible. Moreover, how far would the authorities of the developed countries agree to finance some of the R&D work that is immediately to be transferred to producers in East Europe and the Third World? In the last decade of the century the problems of the car industry might well be of quite another order of magnitude than those now faced by textiles or steel.

The chemical industry

During the next fifteen years the development of the world's chemical industry will differ profoundly from that of the last fifteen years, with demand growing more slowly and changing in composition, costs probably rising, and geographical redeployment as the main features.

Another sector bearing a burden of past growth is the chemical industry, which more than doubled its world output between 1965 and 1975. Its main features are well known; a high degree of innovation, a varied range of interdependent products, a small number of multinational firms (at least where those dealing with raw materials are concerned), an output of US $ 440 billion in 1976, mainly concentrated in the OECD countries, sales which flow through the whole of the economy and especially the chemical industry itself, textiles and clothing, construction, electrical and electronic equipment, services, agro-food, metals, and printing and publishing. In 1974 the chemical industry accounted for something like 10 % of total value added by the manufacturing industry in the United States, Western Europe and Japan, with employment of the order of 5 to 6 % of the corresponding total employment (Table 60).

According to the raw materials used, the processes employed, the product and the markets, the chemical industry is divided into heavy chemicals (raw materials, main intermediates, derivatives) and fine chemicals turning out a large number of products (pharmaceuticals, pesticides, cosmetics, detergents, etc..). The petrochemical industry can be defined in two different ways depending on the case, to designate either that part of heavy chemicals that is based on naptha and petroleum gas, or all the products resulting from the use of those raw materials, including the stage of fine chemicals.

Table 60

Estimate of world chemical production
(billion current US $ and %)

	1960		1976	
	Value	%	Value	%
North America	27.6	36.8	108.5	24.5
West Europe	20.7	27.6	130.0	29.5
Japan	3.1	4.0	39.5	9.0
East Europe and USSR	18.7	25.0	110.0	25.0
OPEC	-	-	1.0	0.3
Latin America	2.3	3.0	22.0	5.0
Other countries	2.6	3.6	29.0	6.7
Total	75.0	100.0	440.0	100.0

During the next 15 years the development of the world's chemical industry will differ profoundly from that of the last 15 years, with demand growing more slowly and changing in composition, costs probably rising, and geographical redeployment as its main features.

Although the chemical industry's capacity for innovation is far from exhausted, there are signs of slower growth in the developed countries' markets for many of its products...

In the industrialised countries the chemical industry whose capacity for innovation is far from exhausted, is nonetheless showing signs of slower growth in the markets for many of its products. The industry will thus play a less decisive part in the economic development of those countries in future than it has done in the last 30 years. As it approaches maturity its growth rate will come closer to that of industry as a whole. In the other geographical areas, on the contrary, it will be at the centre of many investment projects.

To illustrate this phenomenon more explicitly INTERFUTURES made estimates, for four areas in developed countries of consumption by product groups in 1990 under Scenario B2. The figures are given in the form of upper and lower limits (Table 61). What do they suggest?

. For ethylene, there is likely to be a marked slowdown in growth and a convergence on the American rates, except in East Europe.

. Plastics may continue to expand rapidly, though at a lower rate than in the past.

Table 61

Assumptions as to consumption of chemicals in 1990

		Consumption (million tons)			Growth rate 1990/76 % per year			
		1976	1990 Low	1990 High	Low	High	Ratio 1970/1965	Ratio 1976/1970
Ethylene	WE (1)	10.4	20.0	22.0	4.8	5.5	23.7	10.3
	EE	2.4	9.0	10.0	9.9	10.7	21.9	15.7
	USA	10.2	17.3	18.5	3.9	4.4	13.8	4.5
	J	3.8	7.7	8.3	5.2	5.7	31.9	3.5
Plastics	WE	15.8	32.0	37.0	5.2	6.3	15.4	6.7
	EE	6.0	15.0	17.0	6.8	7.7	15.6	11.0
	USA	12.2	22.0	26.0	4.3	5.6	11.3	6.4
	J	4.9	12.0	14.0	6.6	7.8	23.6	0.6
Cellulose Fibres	WE	0.64	0.30	0.68	-5.2	0.4	-1.8	-3.8
	EE	1.20	1.30	1.60	0.5	2.1	3.5	2.9
	USA	0.38	0.14	0.27	-6.9	-2.4	-2.7	-8.1
	J	0.23	0.11	0.26	-5.1	0.9	-1.3	-6.7
Non-cellulose Fibres	WE	2.0	3.5	4.1	4.0	5.2	18.5	7.0
	EE	1.0	2.5	2.8	6.5	7.3	23.2	15.5
	USA	2.6	3.6	4.0	2.3	3.1	13.8	9.6
	J	1.2	n.a	n.a	n.a	n.a	20.7	3.7
Synthetic Rubber	WE	1.8	2.1	2.7	1.1	3.0	11.5	3.7
	EE	2.1	n.a	n.a	n.a	n.a	6.0	11.3
	USA	2.2	2.2	2.6	0.0	1.2	4.5	1.9
	J	0.7	0.9	1.1	2.5	3.7	23.2	4.9
Nitrogenous Fertilizers	WE	8.7	12.0	15.0	3.6	4.1	7.8	4.0
	EE	11.9	21.0	23.0	3.2	4.3	13.6	6.6
	USA	9.6	16.0	17.5	3.8	4.4	9.2	4.2
	J	0.7	0.7	0.9	0.0	1.8	0.4	-1.9
Soaps and Detergents	WE	5.9	9.7	10.4	3.6	4.1	5.2	3.1
	EE	2.5	3.9	4.5	3.2	4.3	-3.2	2.2
	USA	6.0	9.1	9.8	3.0	3.6	4.2	4.5
	J	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Paints and Varnishes	WE	4.7	7.8	8.3	3.6	4.1	5.2	3.3
	EE	4.4	n.a	n.a	n.a	n.a	9.6	6.6
	USA	4.4	5.9	6.2	2.1	2.4	3.0	2.7
	J	1.4	2.7	2.9	4.8	5.3	10.4	4.9

(1) WE: West Europe; EE: East Europe including USSR; J: Japan. n.a: not available or calculable

. The decline in the cellulose fibres will continue, except in East Europe because of the growth in national incomes, while consumption of non-cellulose fibres will continue to grow as in the past but at a slower rate.

. Demand for synthetic rubber will remain a mature demand with hardly any growth.

. Consumption of nitrogenous fertilizers depends on the trend in agriculture. A small growth rate is likely in the developed countries.

. Soaps and detergents are likely to continue to show a decline in the ratio of consumption to national income, which will depress future growth rates.

. The ratio of consumption of paints and varnishes to national income has been practically constant in the past. Future trends will therefore depend very closely on the general rate of growth.

. The methods used do not enable estimates to be made of rates for pesticides or pharmaceuticals, but in both cases the elasticity of consumption in relation to national product tends to decrease in the developed countries.

... but demand in the Third World will grow faster.

What additions have to be made if the Third World is taken into account? Initially its share is a small one. In 1974, out of a world production (excluding China) of 100, Latin America took 4.7 % Africa 1.8 % and Asia 5.1 % of total consumption of the main finished products of the petrochemical industry. A UNIDO scenario, in which the assumptions are not very different from those of Scenario B2, proposes the picture given in Table 62 for the year 2000, i.e. very significant growth in the share of the Third World in world consumption. As for pharmaceuticals, there is no need to stress the considerable size of potential demand from the developing countries.

Table 62

Consumption of chemicals in the year 2000

(million tons)

	Industrialised Countries	Developing Countries	World	Third World share of demand
Annual growth rate % 1975/2000	3.5	5.2	4.0	
Synthetic fibres	28.4	14.0	42.4	33%
Plastics	158.7	38.9	197.6	19%
Synthetic rubber	19.7	5.9	25.4	23%

Source: UNIDO, Study on the petrochemical industry, 1978

These orders of magnitude already reveal large changes in the composition of demand by geographical area and by main product group. However, new innovations are expected to cause drastic changes in the demand for fine chemicals which this report cannot undertake to describe.

Because of raw materials, energy and the environment, costs in the chemical industry may increase, but probable innovations make the prospects especially bright in fields such as research on synthetic materials, chemistry of natural substances and technologies at the interface between chemistry and biology.

What changes in the factors of production may interfere with these changes in demand?

So far as the raw materials of the petrochemical industry are concerned, there is no need to expect in the next 10 to 15 years that oil and natural gas will be replaced by other sources such as coal. As for the choice between oil and gas, it will mainly depend on local prices and availabilities. Even in the longer term there should not be any serious problems of supply: the petrochemical industry will extend its range of consumption to gas oil, fuel oil and subsequently crude oil itself, while the car industry will encourage the extraction of petrol (traditionally consumed by the petrochemical industry) from other raw materials (coal, oil shale, biomass, etc..). In these circumstances, upstream integration in the chemical industry towards oil and coal appears unlikely, but integration of the oil industry downstream towards chemicals might well continue.

The need to save energy is an important objective for the chemical industry, the more so as it is not always easy for it to pass on energy price increases in its own prices.

The growing attention being paid to environment has and will have serious consequences for the industry. Many of its products, waste products and processes have given rise to anxiety about their impact on the environment. There is accordingly very high operating and investment expenditure to control pollution and to comply with the new regulations (in terms of investment these account in the United States for 11.4 % of all investment in the chemical industry). The short-term result of this has been a simultaneous fall in profits, R&D effort, and the creation of new products. In the long term, however, the industry will have to find safer and less polluting technologies and products.

The industry's ability to innovate is nonetheless still considerable, and the prospects seem especially bright in fields such as research on synthetic materials, chemistry of natural substances and technologies at the interface between chemistry and biology.

The tendencies outlined will lead to changes in the structure of the industry in West Europe, the United States, Japan, East Europe and the Third World.

The tendencies which we have just outlined will lead to changes in the structure of the industry:

. In West Europe, the petrochemical industry is at present the main producer and the main exporter, in comparison with the other areas of the world. Mainly concentrated in the EEC, its position will become vulnerable to competition from East European countries, European countries outside the Community, and developing countries. The substantial reduction in investment in petrochemicals will be made more acute by present overcapacity and the slowdown in demand, and it is not impossible that producers' cartels and protectionist barriers may appear.

As a reaction there will probably be a general trend towards improvement of the performances of products (plastics, fibres, elastomers, resins, etc..) to avoid competition from mass products from the new producing areas.

The situation is quite different for fine chemicals: the German, Swiss, and to a smaller extent, British, firms are in a strong position on the international market, and are likely to continue their penetration of the markets of the developed countries, especially by investing in the United States.

. In the United States a balanced growth of supply and demand for chemicals might continue, thanks to the existence of a large homogeneous market. The relative advantage enjoyed by firms in the prices of raw materials, thanks to government energy policies is likely to be gradually reduced.

The American companies are in strong positions in fields such as detergents and in some sub-sectors of fine chemicals (light-sensitive materials, additives, pharmaceuticals): in the development of new materials they will benefit from the efforts made by that country in electronics, space, energy and defence.

On the other hand, they are likely to continue to disengage in geographical areas and market sectors where they are in a weak position, in order to concentrate on products and technologies where they may win and retain a large share of the market. This policy is already becoming clear in the recent behaviour of the large American chemical companies in Western Europe.

. In Japan the petrochemical sector has grown much faster in the past than the economy as a whole (output of ethylene increased at an annual rate of some 21 % from 1965 to 1974). In future this sector will not experience such rapid expansion and will follow the growth rate of the overall economy. Moreover, Japan's petrochemical industry will come to operate on an international scale, mainly by taking part in joint operations with the oil-producing countries.

At the same time Japan will develop fine chemicals, a field in which the Japanese firms already have real advantages (fermentation technology, light-sensitive materials) in order to increase its market shares in the specialised sectors. It will increase its efforts to diversify in fields such as cosmetics, health products, medical equipment and biological technology.

Lastly, the Japanese project engineering firms will become much more active on the international markets selling and establishing chemical processes.

These three large OECD areas will, however, have to take increasing account of East Europe and the Third World.

. In East Europe the chemical industry will become an important sector in the USSR, East Germany, Poland and Romania. With the help of Western technology, large-scale investment will be made in sectors such as basic petrochemicals, plastics, fibres, pesticides and dyestuffs.

The acquisition of chemical plants in exchange for future deliveries of products should continue. This practice avoids outflows of foreign currency, enables large factories to work at full output while adjusting to the gradual growth of the domestic market, and provides a guarantee against risks of unsatisfactory operation.

Despite their opposition to this form of technological transfer, Western firms are likely to be obliged to agree to it unless they are successful in taking up common positions, but they will undoubtedly try to diversify the re-imported products.

. In the Third World, expansion in the petrochemical sector will continue in line with the growth of markets for petrochemical derivatives (e.g. in Brazil, Mexico, Argentina, Iran, China, India and Indonesia). Growing at times more rapidly than domestic demand, the sector will produce a surplus which the international market will have to absorb. It may thus be expected that these countries will acquire significant market shares in such areas as nitrogenous fertilisers, methanol, aromatics, fibres, the common plastics, and so on.

At the same time the tendency towards vertical integration will continue in those sectors which use domestically-produced raw materials (oil, natural gas, phosphates, titanium and fluorine ores, etc..) with the twofold purpose of exploiting resources and increasing industrialisation. In both case, however, account has to be taken of profitability, and this will slow down development as compared with forecasts that might be based solely on the major chemical projects now being studied.

As an illustration, Table 63 reproduces the output figures from the UNIDO scenario already referred to in connection with consumption.

Table 63

Production of chemicals in the year 2000
(million tons)

	Industrialised countries	Developing countries	World	Proportion of Third World Demand
Synthetic fibres	30.6	11.8	42.4	27 %
Plastics	166.6	31.0	197.6	15 %
Synthetic rubber	21.2	4.1	25.3	16 %
Ethylene	91.4	20.0	111.4	18 %

Source: UNIDO, Study on the Petrochemical Industry, 1978

Chemical manufacturers in the developed countries will adapt themselves to the new context with the help of technology, by developing fine chemicals and by more joint ventures with firms in the Third World, but the industry will not expand its labour force in the developed countries during the next decade.

On the whole, while the active ingredients which are essential to fine chemicals will largely continue to be produced by the technologically advanced countries, the next decade will see initiatives to produce specialised chemical products adapted to the markets of the Third World and East European countries. Joint operations between the multinational firms and those of the Third World are likely to become more common. The growth of the chemical industry will slow down in the developed countries, even if its rate of growth remains higher for a time than that of manufacturing industry as a whole. On the other hand, there will be an acceleration of its expansion in the Eastern and Third World countries.

The developed countries will defend themselves with the help of technology. New innovations might bring certain hitherto uninteresting synthetic chemical substances into prominence by giving them properties at present unforeseen.

Sub-sectors of the chemical industry such as that of synthetic fibres have been going through a crisis of overcapacity in recent years which has seriously worsened the financial situation of many firms. The problem is now extending to plastics. European industry might be especially affected by this in view of the sensivity of its exports to international competition. Re-establishment of a balance between supply and demand might then last throughout a decade.

During the next ten years the chemical industry will not be expanding its labour force in the developed countries. However important it may be, the movement towards the provision of services associated with the delivery of products will at most make it possible to absorb the workforce laid off from production.

One of the problems which the governments of developed countries will have to consider seriously is whether they should finance a part of the R&D investment in chemicals, especially those of a strategic nature which the firms in the sector have been obliged to cut back heavily under the pressure of financial constraints.

(c) A traditionally important industry: shipbuilding

Shipbuilding illustrates the consequences, in a slow-growth industry, of the interaction between economic factors and government intervention.

Inside the OECD area which, as we have seen, accounts for almost 90 % of world production, the share of this branch in industrial production, value added or employment varies very considerably from one country to another: more than 10 % in Norway, 5 % in Denmark, 3 % in Sweden, more than 2 % in the Spain and Japan, and only 0.5 % in the United States. By comparison, it is more than 2 % in Poland and Yugoslavia, and almost 1 % in South Korea.

Devoting a few pages to this industry is very worthwhile in that it offers an admirable illustration of the consequences, in a slow-growth industry, of the interaction between economic factors and government intervention. The same situation could well occur in other industries.

The current shipbuilding crisis is not merely a business cycle phenomenon. It also reflects profound structural changes which will continue during the coming decade, and which will pose serious problems for a number of traditional shipbuilding countries.

Shipbuilding will suffer primarily from slow growth in world demand.

Compared with other branches such as the automotive industry, where growth prospects at world level are still considerable, shipbuilding will suffer primarily from slow growth in world demand. This demand is the sum of demand for growth resulting from the expansion of seaborne goods transport and renewal demand based on technical progress and the age distribution of the fleet.

The growth of shipping is going to slow down considerably. There are many reasons for this: The probable slowdown and change in content of the growth of the developed countries, and especially Japan which, in the past, generated more than half of the increase in bulk transport and more than three-quarters of raw material sea transport; the processing by the developing countries of their own raw materials; the slow growth, stagnation and finally decline of crude oil transport (coal transport only partially offsetting this trend); the development, though only on a minor scale, of other forms of transport.

Given the above and the surplus capacity of the world fleet, medium-term demand prospects are very poor and long-term prospects not very encouraging:

. The surplus oil tanker capacity will be absorbed only slowly in the medium term on the basis of both favourable and unfavourable factors such as: developed-country growth rates, energy-saving policies, the enlargement of the Suez Canal, the development of pipelines in the Middle East, and pollution control regulations. The surplus will probably only disappear between 1983 and 1990, but this date will mark the beginning of the decline of oil(1).

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(1) Cf. Part I of this report

. The prospects for liquefied gas transport are infinitely more favourable since world trade could reach 150-220 billion cubic meters of liquefied natural gas by 1990, compared with 22 in 1977. The chemical tanker fleet can also be expected to grow as a result of the development of the petrochemical industry in the OPEC countries, or fertilizer trade originating in Asia or Africa.

. A recent study by Maritime Transport Research concludes that annual demand for dry cargo ships should remain at between 12 and 14 million dwt per annum from 1976 to 1985, whereas it fluctuated between 12 and 17 million from 1967 to 1976. However, ore-carriers will probably be cut back by almost 50 % (from 4 to 6 million tons per annum) to the benefit of the "other dry cargo" fleet, for which there is a trend both towards specialised vessels (barge-carriers, for example) and towards multi-purpose vessels.

A complete survey of demand would obviously involve taking account of the other types of vessel (fishing fleet, ice-breakers, etc..), floating factories and offshore oil rigs, but overall prospects would be essentially the same.

The effects that the different scenarios would have on these prospects are easy to identify. Scenario C, for example, would encourage shipbuilding in the Third World and affect it seriously in Western Europe and Japan. Similarly, the spread of protectionism would be prejudicial.

The location of production is determined by economic conditions and policy measures. Their combination accounts for the differences in regional prospects.

This is the context in which production location factors will be assessed. Both economic and political considerations are involved:

. The economic determinants of production differ according to the type of vessel. At one extreme, there is standardised tonnage such as oil tankers and ore carriers. Design and development costs are low, long production runs are possible, and sub-contracting is easy. In the long term, the importance of labour costs and the relatively modest qualifications required will give the developing countries an undoubted advantage. At the other extreme, there are specialised vessels: methane carriers, research vessels, barge carriers, etc.. Their construction requires highly skilled labour and appreciable R&D. The developed countries ought therefore to retain a clear advantage in this respect.

. However, both in OECD countries and in the developing countries, the shipbuilding industry benefits from a variety of political measures: investment subsidies, subsidisation of supplies, export promotion measures, and support of national shipyards. In particular, many developing countries give priority to the development of this industry which generates jobs and brings in foreign exchange. At the same time, they are seeking to have a growing share of their exports and imports carried on their own ships. For the COMECON countries, security of supplies and foreign exchange procurement seem to be the reason for the efforts made, while the OECD countries are primarily concerned with protecting employment.

What then can be said as regards regional prospects?

- Japan will remain the foremost shipbuilding nation in the world, but employment in the industry will continue to fall and activities will become more diversified.

Japan is the foremost shipbuilding nation in the world, and alone accounted for 45 % of world output of merchants ships in 1977, i.e. five times more than the second-largest producer, Sweden. The spectacular development of this branch since 1955 is the result of the industrialisation of an insular economy importing raw materials and exporting manufactures. Close co-operation between yards and shipowners, sustained financial assistance, an efficient firm structure, remarkable managerial capabilities, and relatively modest wage costs have allowed Japanese shipyards to equip the bulk of the fleet which carries Japan's foreign trade, while at the same time remaining fully competitive on the international market. The future will prove more difficult: the decline in Japan's growth rate, the slowdown of world demand for ships, and competition from new countries to build liquid or bulk carriers will force the Japanese shipbuilding industry to produce complex vessels. In this field, Japan will also face strong competition from Western Europe. Japanese shipyards have in fact contributed significantly to the development of new production capacities in South-East Asia and Latin America, thereby helping to accelerate the arrival of the present situation. Japan will remain the biggest shipbuilding nation in the future, but employment in this branch will continue to decline and activities will diversify (offshore equipment, factory ships).

- While not becoming a serious competitor on the world market, the American shipbuilding industry may increase its share of an expanding domestic market.

In 1976, North America yards accounted for 3.1 % of world production. Canada contributed less than a quarter of this total, and does not seem to have any ambition to develop its shipbuilding apart from transport for the Great Lakes, along the coast and perhaps in the Artic. The shipbuilding industry in the United States regained momentum when the Merchant Marine Act of 1970 was enforced. The country's present aims are to establish a competitive merchant fleet carrying a significant proportion of US seaborne trade, and to increase employment in the industry - the more so as seven of the main shipyards are located in areas of chronic under-employment. Despite being subsidised, the industry has been affected by the recession and 180,000 jobs may be threatened in shipbuilding and in associated industries over the next five years. Nevertheless, the future is relatively bright. While not becoming a serious competitor on the world market, the American shipbuilding industry may gain an increasing share of an expanding domestic market through liquefied gas transportation, oil tanker demand (1), shipping on the lakes, naval demand, providing offshore activities, and an interest in nuclear-powered ships.

- In Western Europe the prospects are far from favourable.

After declining rapidly up until 1968, Western Europe then succeeded in stabilising its share in world production at the 40 % level; however, prospects are far from favourable:

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(1) For specifically American reasons: environmental regulations, oil production in Alaska, creation of a strategic reserve.

- A recent EEC study shows that the Community share, which was slightly above 20 % in 1975, will probably be only 19 % in 1985; from 4.4 million cgrt in 1975, production could fall to 3 or 4 million cgrt after a low of 2.4 in 1980. This would mean a 45 % reduction of employment in shipyards, i.e. including associated industries, the loss of 90,000 jobs in all.

- In Northern Europe, the Danish shipbuilding industry has been seriously affected by the crisis. In 1976, oil tankers and ore carriers accounted for 90 % of production and 50 % of its output was exported. It will have to reduce employment from 13,000 to 10,000 workers over the next three years. Norway, which has 88 shipyards providing up to 90 % of employment in local communities, has had to introduce particularly vigorous measures. The most original of these concerns sales to the developing countries: Third World countries ordering ships at Norwegian yards receive credits up to 100 %, repayable over 15 years at interest rates in the region of 5 %, and each contract contains a grant element of 25 % under the heading of aid. Despite these efforts, and although there has been greater emphasis on offshore activities, capacities are expected to be reduced by between 30 and 40 % in 1980 compared with 1975. The situation is similar in Sweden where the shipyards could become involved with methane carriers, floating liquefaction plants, and offshore equipment.

- Spain, the third most important shipbuilding nation in the world, will have fewer difficulties since there is still considerable scope for increasing the share of Spanish-built vessels in its merchant fleet. As for Yugoslavia, which is 14th world producer and which exports 95 % of its output, it can hope to take advantage of its membership of the Group of 77 and maintain its exports to the Third World.

- Eastern Europe has become a shipbuilding region of prime importance.

Eastern Europe has become a shipbuilding region of prime importance. Its share in world output has doubled in 16 years: 2.7 % in 1960, 5.5 % in 1976. The USSR is the leading producer in the region, but Poland is the most dynamic. Polish shipyards are particularly competitive as regards quality, delivery dates, prices and financial advantages. The situation with regard to prices is not only due to different accounting practices; it stems from production methods, the quality of labour, research efforts, the volume of investment, and integration with suppliers of equipment. Some studies reckon that the Eastern countries will have a production capacity equal to some 25 % of world demand by 1980.

- There is no example in the Third World to approach that of South Korea, but the growth of capacities in South-East Asia and Latin America will be noteworthy.

In the Third World, the remarkable growth of shipbuilding in South Korea has already been emphasised. Although the shipbuilding capacity of South Korea may be equal to one-third of world demand by 1981, five additional yards are planned for the period 1982-1986. The shipbuilding industry will benefit from the expansion of the merchant fleet and the growth of Korean trade (at present only a small percentage of Korean seaborne trade is carried on Korean-owned ships and 80 % of the Korean fleet was built abroad), but it will also be necessary to increase exports, which would appear feasible since Korean shipyards will still enjoy comparative advantages. Already, the South Korean shipbuilding industry is diversifying towards more sophisticated vessels and the construction of floating factories. Even if there is not yet any guarantee that this strategy of massive development of the shipbuilding industry will prove profitable from the South Korean point of view alone, it can be stated that the structure of the world shipbuilding industry will be profoundly changed.

There is no other example in the Third World to approach that of South Korea, but the growth of capacities in South East Asia and Latin America mentioned in Part II, will strengthen the trends just described.

Shipbuilding will continue to pose problems for the OECD countries.

For the OECD countries, shipbuilding will continue to pose substantial problems: problems concerning the distribution of the adjustment between Western Europe and Japan (which should be eased by increasingly similar production conditions), problems concerning the distribution of the adjustment between the European countries (aggravated by the regional concentration of employment), problems concerning relations with countries where decisions do not depend on the market situation, and the advisability of consultations with new shipbuilding nations. In some cases, protectionist policies are conceivable, but they will not prevent cuts in employment and will only serve a useful purpose if accompanied by positive schemes to create a competitive industry in precisely defined areas.

(d) An example of a basic industry: the iron and steel industry

The history of the iron and steel industry has been closely connected with the dynamics of industrialisation. A vital question is to what extent current problems are due to the economic situation or to structural change. To attempt a reply one must consider the trend in the sector since 1960, the outlook for consumption and production, and the policy problems liable to face governments.

World production of crude steel, totalling 675 million tonnes in 1976, is only surpassed by that of oil and coal, while total world production of the main non-ferrous metals (aluminium, copper, lead and zinc) amounts to only 32 million tonnes, i.e. 5 % of the volume and 25 % of the value of the output of steel.

This indicates the importance of an industry whose history has been closely connected with the dynamics of industrialisation. It took 50 years from 1870 for world production of crude steel to reach 100 million tonnes. The 200 million tonne mark was passed in 1951, i.e. 31 years later, and it took only two years, from 1972 to 1974, for production to rise from 600 to 700 million tonnes.

Recent difficulties, however, are a reminder that the long-term trends conceal violent cyclical fluctuations and periods of medium-term slowdown. They raise a vital question: to what extent are current problems due to the economic situation or to structural change?

To attempt a reply one must examine the trend in the iron and steel sector since 1960, consider the outlook for consumption, describe the outlook for production (allowing for the impact of new technologies) and analyse the policy problems liable to face governments.

The expansion of the preceding 15 years ended in the deep recession of 1974-78, aggravated by increases in capacity since 1974.

What, in a few lines, are the major features of the last 15 years?

. From 1960 to the last recession the distribution of steel consumption and production between the OECD area, the centrally-planned economies and the rest of the world exhibited great stability. From 1960 to 1970 the OECD area's share of production changed from 66.3 % to 65.9 % and of consumption from 62.4 % to 62.3 %, while the share of the centrally-planned economies remained at about 30 % in both cases. From 1975 to 1977, however, the picture was quite different, with the OECD area's share of consumption falling to 52% and of production to 60%. Was this a break in the trend or a cyclical fluctuation.

. But there have been structural changes within the OECD area. While during the sixties the area's total production of crude steel increased by 70 % (from 229 to 394 million tonnes), Japan's production alone increased by 270 % (from 19 to 70 million tonnes). Italy and Spain also developed their production considerably, but they were still net imporrers in 1970, whereas Japan's net exports rose from 2.7 million tonnes in 1960 to 23.4 million in 1970. Since in the centrally-planned economies supply and demand almost balance out, Japan's exports exert a competitive pressure on the European and North American iron and steel industries in the markets of the United States and the Third World (Table 64).

. To sum up, until the recession both capacity and consumption were developing more or less in line and until 1974 over 90 % of effective production capacity was being utilised, but when the world recession hit steel and a sharp fall in demand appeared likely or actually began to occur, steel industries throughout the world did not stop expanding their capacity. As a result utilisation rates collapsed, falling from between 66 and 75 % in 1975/76 (Table 65) to under 60 % in 1977/78 in the European Economic Community and to 67 % in 1977 in Japan.

The effects of this situation are easily described. Although in 1978 steel consumption almost regained its record 1974 level, the global and regional imbalances between demand and capacity continued; international trade flows diverged considerably from traditional flows; prices reached their lowest levels; producers' disastrous financial outturns stopped investment in modernisation and rationalisation, and the structural adjustments required threatened employment in areas where the rate of unemployment was already high; governments increased their participation, in various forms, in the iron and steel industry and intervened in the international steel trade and sometimes in the domestic steel trade also.

The reason for this state of affairs? Like many other industries, the iron and steel industry did not forecast world economic development correctly. The optimistic forecasts of economic growth at the beginning of the decade were used as a basis for extrapolation steel consumption and for taking decisions to expand capacity, whence the importance of considering, with the caution enjoined by this experience, the outlook for consumption.

From 1970 to 1978 the long-term forecasts of consumption have been continually revised downwards, but two trends remain:

- *lower growth rates for consumption than in the past;*
- *a smaller share in world consumption for the developed countries in the East and West.*

Table 66 gives some long-term forecasts made between 1970 and 1978 and is instructive. The downward revision over time of the estimates of consumption in 1980 and 1985 is a good illustration of the trend of expectations produced by the crisis. It is not the intention of INTERFUTURES to add a further unreliable forecast to the existing list, but almost all the studies carried out show two trends which agree with the analyses in this report:

. In the long term the growth rates of future demand will be lower than in recent years.

. The main consumers will still be the developed OECD countries and the centrally-planned economies, but their share will fall from 85/90 % to 65/70 % by the end of the century.

Table 64

Crude steel production, steel consumption in gross tonnage equivalent, and difference between production and consumption, by major world areas, 1960-1975
(in millions of metric tonnes)

	1960			1965			1970			1975		
	Production	Consumption	Balance	Production	Consumption	Balance	Production	Consumption	Balance	Production	Consumption	Balance
OECD	228.7	213.9	+ 14.8	305.8	285.6	+ 20.2	393.5	366.8	+ 26.7	383.8	330.0	+ 53.8
- USA	90.1	89.9	+ 0.2	121.9	128.1	- 6.2	122.1	127.3	- 5.2	108.0	116.8	- 8.8
- EEC	98.1	81.7	+ 16.4	113.9	91.4	+ 22.5	138.1	123.5	+ 14.6	125.6	98.0	+ 27.6
- Japan	22.1	19.5	+ 2.6	41.2	28.5	+ 12.7	93.3	69.9	+ 23.4	102.3	64.7	+ 37.6
Other market economy countries (developing countries and South Africa)	12.0	21.7	- 9.7	20.3	35.5	- 15.2	27.5	45.2	- 17.7	42.1	73.6	- 31.5
Centrally planned economies (including China)	104.3	107.1	- 2.8	132.9	130.4	+ 2.5	176.1	177.0	- 0.9	221.8	235.2	- 13.4
World Total	345.0	342.7	+ 2.3	459.0	451.5	+ 7.5	597.1	589.0	+ 8.1	647.7	638.8	+ 8.9

Table 65

Crude steel production, effective production capacity and capacity utilisation rates in OECD countries from 1965 to 1975 (million tonnes)

Country	1965	1970	1973	1974	1975
USA					
Production	119.3	119.3	136.8	132.2	105.8
Capacity	135.5	138.7	142.5	140.6	138.9
Utilisation rate	88.0	86.0	96.0	94.0	76.2
EUROPE					
EEC					
Production	113.9	137.5	150.1	155.6	125.6
Capacity	134.0	156.5	173.8	178.9	190.1
Utilisation rate	85.0	87.9	86.4	87.0	66.1
OTHER COUNTRIES (1)					
Production	13.7	21.9	26.4	28.2	26.5
Capacity	15.8	25.2	29.1	30.8	32.0
Utilisation rate	86.7	86.9	90.7	91.6	82.8
JAPAN					
Production	41.2	93.3	119.3	117.1	102.3
Capacity	47.4	103.0	129.5	136.3	148.0
Utilisation rate	86.9	90.6	92.1	85.9	69.1
Total OECD					
Production	302.6	390.1	453.6	454.5	381.3
Capacity			498.7	510.1	533.4
Utilisation rate			91.0	89.1	71.5

(1) Excluding Yugoslavia

Source: OECD, The Situation in the Iron and Steel Industry, 1977

Table 66 Past trend and forecasts of crude steel consumption

Countries/ areas Years	World Total	Developed countries Total (10)	 USA	 Japan	 EEC (3)	Developing countries	Eastern European countries
1970 Actual	589.0	371.6	127.3	69.9	123.5	40.5	176.9
1975 Actual	638.9	336.5	116.8	64.7	98.0	67.2	235.2
1976 Actual	681.5	365.2	129.9	60.2	116.6	72.5	243.8(8)
1980							
IISI (1972)	939.2	539.9	170.0	112.5	161.7	88.3	311.0
IISI(5) (1976)	902.0	522.0	(2)	(2)	(2)	93.0	287.0
EEC (1976)	(2)	(2)	(2)	(2)	156.5	(2)	(2)
SRI (1976)	899.6	521.8	169.5	105.4	158.0	98.4	279.4(9)
PHB (1977)	564.0(4)	(2)	151.0	83.0	136.0	(2)	-
JISEA (1977)	564.0(4)	(2)	151.0	83.0	136.0	(2)	-
EEC (1978)	(2)	(2)	(2)	(2)	135.9	(2)	(2)
1983							
UN, ECE (1976)	1155.0	(2)	195.0	102.0	164.0	(2)	359.0(11)
1985							
IISI (1972)	1144.4	636.7	190.0	133.8	189.1	122.5	385.2
USBM (7) (1975)	1108.5	(2)	194.6	(2)	(2)	(2)	(2)
IISI (5) (1976)	1129.0	627.0	(2)	(2)	(2)	138.0	364.0
SRI (1976)	1107.7	619.8	192.9	129.6	187.1	142.1	345.8(9)
ONUDI (1976)	1069.0	563.0	188.0	112.0	163.0	165.0	341.0
EEC (1978)	(2)	(2)	(2)	(2)	153.3	(2)	(2)
1988							
UN and ECE (1976)	1572.0	(2)	235.0	128.0	196.0	(2)	481.0(11)
1990							
SRI (1976)	1354.3	735.8	218.7	161.2	224.2	200.8	417.7(9)
IISI (1978)	1293.3	666.5	213.7	151.6	185.5	207.1	419.7
EEC (1978)	(2)	(2)	(2)	(2)	170.9	(2)	(2)
2000							
USBM(7) (1975)	1662.9	(2)	233.5	(2)	(2)	(2)	(2)
SRI (1976)	2022.7	1046.0	282.5	255.2	321.5	381.6	595.1(9)
UNIDO(6)							
Var. I (b)	1665.0	763.0	253.0	151.0	219.0	535.0	367.0
Var.II (a)	1925.0	763.0	253.0	151.0	219.0	795.0	367.0

(1) Apparent consumption. (2) Figures not given. (3) EEC of the Nine. (4) Excluding East European countries. (5) Including continuous casting. (6) The UNIDO gives variants with different consumption trends in the Third World. (7) Figures converted into metric tonnes and crude steel equivalent. (8) IISI figures quoted in T. Kono: Changing corporate environment and countermeasures of the steel industry, 1977. (9) Excluding North Korea. (10) Including Greece, Spain and Turkey. (11) Excluding China and North Korea.

Abbreviations SRI: Stanford Research Institute. USBM: United States Bureau of Mines. UN ECE: United Nations, Economic Commission for Europe. JISEA: Japan Iron and Steel Exporters' Association. PHB: Putnam, Hayes and Bartlett Inc. IISI: International Iron and Steel Institute.

There are two trends which call for comment:

Underlying the lowering of demand forecasts in recent years is of course the 1973/75 recession, the abortive recovery and the low rate of growth which followed. If overall growth developed as in Scenario A, the demand for steel would pick up considerably, but such an outcome is doubtful and, if the slow growth in Scenario B2 continues for long, the demand for steel will increase more slowly than in the past.

To the effect of this overall growth is added a second cause, namely the lower consumption of steel per unit of domestic product in the developed countries. This reduction is largely cyclical, being due to decreased investment during the recession and perhaps to a lower proportion of investment in steel in such a situation, but it is also due to long-term trends such as the increasing share of the services sector and changes in the content of industrial output.

From the point of view of steel consumption this last trend involves three further aspects. First, industrial redeployment to some extent favours the developing countries as locations for industries which are traditionally large consumers of steel such as shipbuilding, the motor vehicle industry and some sectors of heavy engineering. Secondly, the steel content of the spearhead industries in the industrialised countries - electronics and automated capital goods - is among the lowest. Finally, in the steel-consuming industries (which will be little affected by structural changes) the demand for steel per unit of output might very well decline owing to changes in product design, or to the replacement of steel by aluminium and plastics. Against these changes there are admittedly a few favourable factors such as the prospect of high-speed railway track construction, but in all probability the overall balance will remain negative.

There is a third reason for lowering the forecasts, namely technological change.

In the past the consumption of fabricated steels grew at about the same rate as the consumption of crude steel, but this will not happen in future, because the spreading use of continuous casting will increase the output of "finished products from crude steel". In Japan, for example, it has been calculated that a 1 % increase in the proportion of continuous casting compared with the total output of crude steel produces a 0.1 % increase in the output of finished products from ordinary carbon steel. As almost all new capacity will now use the continuous casting process, the output of crude steel required to satisfy demand will fall appreciably; as a guide, the IISI's revised forecasts (1976) estimate that this factor will account for from 7.5 to 8 % of world consumption of crude steel.

The iron and steel industry of the future will not suffer from a shortage of raw materials and will therefore be able to adjust production to increases in demand. If in each area the steel consumed is produced mainly on the spot, output can grow in new countries without making it fall in absolute terms in the traditional steel-making countries. Whether there is further redeployment or not will depend on many factors; political factors, economic factors such as the presence of skilled manpower, availability of energy, environmental features, transport conditions, possibilities of utilising by-products and wastes, technological change, comparative advantages of new plant, international trade barriers, etc.. The multiplicity of these factors and the many different kinds of steel and steel products will give rise to different trends for different products. In future the traditional steel-making countries may be less competitive in sections than in flat products, in plate than in sheet. The sharp growth in the use of high quality steels (alloy steels and stainless steels) in the industrialised countries probably points to one of the directions in which production will move in these countries.

How can traditional producers meet the challenge of new producers in the Third World, and further, how can producers in the United States and certain European countries meet the challenge of Japan, Australia, Canada and South Africa?

Traditional producers in OECD countries will have to meet the challenge of new producers in the Third World, but by the end of the century they will probably be producing just under 50 % of world output and competition between them will still be an important factor in the iron and steel market.

Three possibilities can be envisaged:

. Increased protectionism. This is no doubt the worst solution from the point of view of the international division of labour, but the chances of such a policy being adopted are strengthened by the importance attached by the developed countries to the steel industry, the degree to which governments are involved in it, and the strong trade union influence.

. Increased investment in productivity at all stages of steel production in order to defend existing sites, but the sector's financial situation makes this solution difficult and, if it is adopted by most traditional producers, it may have the secondary effect of causing increases in capacity which are incompatible with the state of demand.

. More redeployment in the industry, whereby the developed countries would concentrate on the downstream stages and on making special steels, while blast furnaces and steel-works including direct-reduction mills would be located in the developing countries. This is a difficult solution, because steel-making is highly integrated and cannot easily be divided into stages which can be carried out in different places.

To sum up, countries such as the United States, Japan, the United States, Japan, the United Kingdom, Germany, France and Italy will continue to be important producers of steel, but their production will grow much more slowly than in the past. There will be rapid development in Canada and Australia and substantial growth in Brazil, Mexico and Venezuela in Latin America; in China, India and South Korea in Asia; and in Iran in the Middle East. By the year 2000, according to the most recent projections, almost 50 % of total output will come from the developed market economy countries, but with larger proportions from Canada, Australia, South Africa and Spain. The centrally-planned economy countries will supply from 28 to 30 % of the total, China accounting for 7.5 % and the rest of the Third World for not much more than 20 %.

Thus, the Third World including China will have difficulty in reaching 30 % but this figure is uncertain. There is the risk that domestic, bilateral or international measures may be taken affecting prices or trade and inhibiting the operation of the market; the increase in energy prices may affect the competitive power of small plants, especially electric furnaces for direct reduction (whereas this technology seemed well suited to developing countries except energy-rich countries such as Venezuela and Iran); and the other two modern steel-making techniques (the integrated complex with oxygen blast furnace, and electric furnaces for scrap) tend to favour location in the developed countries.

One final remark; nine European, seven United States and four Japanese companies together produce almost 65 % of world output of steel (excluding centrally-planned economies), and the Nippon Steel Corporation and the US Steel Corporation each produces more steel than all the Third World countries put together, which shows the continuing importance of competition in the North in the iron and steel market.

(e) From the outlook for industry to the sectoral aspects of interdependence

In a context of moderate growth, industrial competition between the developed countries will become keener, and all the more so if industrial products from East European countries and a part of the Third World come on to the world market.

The lesson taught by these cases with regard to the outlook for world industry will not be dealt with fully until the next Section but the message in Part III is already acquiring a new dimension; in a context of slower growth, industrial competition between the developed countries will become keener, and all the more so if industrial products from East European countries and a part of the Third World come on to the world market. This situation will not make it easier to co-ordinate counter-cyclical policies or to frame compatible adjustment policies. Consequently industrial developments will be increasingly taken into account by governments in choosing strategies and in turn will depend greatly on the latter. This is to acknowledge the importance of industry in the sectoral aspects of interdependence.

3. THE SECTORAL ASPECTS OF INTERDEPENDENCE

The study of the sectoral aspects of interdependence starts with three areas which extend well beyond the economic sphere (disarmament, migration, protection and development of humanity's common heritage), continues with three economic areas (natural resources, industry and agriculture) and ends with more general questions of management (international trade, adjustment of the monetary system and co-ordination of short-term economic policies and structural adjustment policies).

A sectoral review of interdependence confirms two findings already revealed :

. A high level of interdependence in a given field causes constant overlapping of national and international problems. But to a certain extent governments' efforts to ameliorate this overlap are constrained because they are under pressure from the partners in the domestic social oligopoly, who do not fully understand the interconnection between their actions and the outside world.

. The growth of interdependence tends to make economic, social, political and military questions increasingly interwoven. As a result, the significance of any division of human activity into separate parts is considerably discredited.

. The analysis begins in fact with three areas which extend well beyond the economic sphere (disarmament, human migration, the protection and development of humanity's common heritage). Then come three important sectors of economic activity (natural resources management, harmonizing the development of world industry, strengthening agricultural expansion). The study ends with questions concerning the world economy as a whole: the management of international trade, the adjustment of the monetary system, and the coordination of short-term economic policies and structural adjustment policies.

Three areas of interdependence which extend beyond the economic sphere(1)

Armament problems may have a considerable economic impact owing to the high level of overall defence spending, the size of the arms industry and the extent of the arms trade, as well as the general spread of military power.

Disarmament. It is not the purpose of this report to study the reasons which account for the world military situation, still less to carry out a forward-looking analysis of its development, but it would seriously distort the description of global economic interdependence if it did not draw attention, in a few lines and four points, to the economic magnitude of armament problems :

. The overall figures for military expenditure are simply stupefying: the annual military budget of all the nations of the world is in the region of 1976 US$ 350 billion - an amount equivalent to the annual gross product of the poorest half of the world population. The annual global budget for military R&D is $25 billion, i.e. more than 40% of the global R&D budget. The annual global budget for arms purchase is $80 billion, i.e. double the combined health and education budgets of all the developing countries.

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(1) Problems arising in the area of armaments and humanity's common heritage have not been studied specifically by INTERFUTURES. Nonetheless, it is necessary to mention the- here because of their importance to the evolution of interdependence.

By large groups of countries, military expenditure breaks down almost like shares in world income (Table 67), but this is no longer the case for individual countries since expenditure ranges from more than 10% of national product (USSR, Israel, Iran, Syria, Iraq, Egypt, Jordan, North Korea and China) to less than 1% (Japan, Mexico, Mozambique, Sri Lanka and Bangladesh). The United States, the countries of Eastern Europe and developing countries such as Saudi Arabia, South Korea and Pakistan fall between 5 and 10%, while the 2 to 4.9% bracket encompasses the European Member countries of NATO and numerous Third World countries such as Argentina, Brazil, Venezuela, India, Indonesia, Morocco, the Philippines, etc.

Whence two questions. If the Eastern countries grow more rapidly than the Western countries and persist with the same percentage of military expenditure, will the Western countries not be forced, at least in the medium term, to raise the percentage of their military expenditure, thereby increasing the amount deducted by the State from national income? What will be the effect of development on arms expenditure by the Third World? The answer to this second question depends no doubt on the policies of those Third World States which aim to become major regional powers. It obviously differs according to the scenario. It is to be feared, in any event, that military expenditure will continue in many developing countries to reduce local investment possibilities.

Table 67

Estimated military expenditure in 1976

Region	Amount (in dollars billion)	Percentage of total
United States/USSR	230	59.3
Other Member countries of NATO or the Warsaw Pact	71	18.3
Other industrialised countries	12	3.1
OPEC Member countries	23	5.9
China	21	5.4
Other developing countries	31	8
Total	388	100

Source: Barry M. Blechman and Edward R. Fried "Disarmament and Development: an analytical survey and pointers for action" 1977.

. Sales of arms and military technology play a significant role in world trade. The volume of world transfers of conventional arms rose from US$ 5.3 billion in 1965 to US$ 8.4 billion (at 1975 values) ten years later, the difference being due mainly to sales to the Middle East and Persian Gulf States (2.3 billion). A small number of suppliers: the United States (49.6%), the USSR (28.6%), France (4.6%), the United Kingdom (3.3%) and Czechoslovakia (3.2%) accounted for almost 90% of sales between 1965 and 1974. The purchasers are more widely spread, but 16 of them accounted for 60% of total purchases in 1975: Iran (17%), Israel (11%), Iraq (7%), Libya (5%), Saudi Arabia, Egypt, Syria, South Korea (3% each), Taiwan, India, and Jordan (2%). Consequently, the main suppliers are dependent on arms sales to a degree which is far from negligible. In the United States, for example, arms exports amounted in 1977 to almost $10 billion, representing some 400,000 jobs and approximately 8% of total American exports. As a result, competition between the main exporters is tending to become increasingly keen.

. Trends in the arms industry parallel those described for industry as a whole. In the first place, the arms transferred are becoming more and more sophisticated. Sales of tactical aircraft, ground-air missiles, anti-tank missiles, etc. have multiplied in recent years. In this respect, the Third World is becoming increasingly dependent on external suppliers. At the same time, however, the countries of the Third World are taking steps to build up an arms industry. These countries are seeking to limit their state of dependence as regards spare parts and replacements, to support their local industry and to become exporters. If present trends persist, a new category of secondary arm suppliers will emerge during the 1980s.

. On top of the problem of the dissemination of conventional arms there is that of nuclear proliferation, which is a legitimate subject of concern to a great many governments of advanced industrial societies. Although it is perhaps tending to slacken, the link between this problem and energy supplies for certain developing countries still remains. In the long term, it may be that the desire to stop dissemination will become a desire to discourage it and to learn to live with it.

Thus, over and above military rivalry between the East and West, the salient feature of the trend with regard to arms is the general dissemination of military power which began during the 1960s, gathered pace in the 1970s and may well have considerable political and military consequences for both the developed and the developing world in the 1980s and 1990s. As far as the scenarios are concerned, this sort of military context is probably not conducive either to general trade liberalisation, or to a very pronounced North-South rift, or to strict North-South regional alignments, or to extensive protectionism between economic poles in the North. It will, on the other hand, strengthen the role played by governments.

This situation will no doubt make it even more important to strengthen economic cooperation between the developed countries of the West and the industrialising Third World countries.

In the next quarter of a century migration problems will become acute, both within the Third World and between the Third World and the developed Western countries.

Human migration. In all the scenarios, with the exception of the North-South breakdown scenario, the developed countries of the West will be subjected to considerable pressure owing to migratory movements from the Third World. Even now, there is a substantial quantity of illegal migration between the developing and developed countries. It is calculated, for example, that there are at present between 6 and 10 million illegal immigrants in the United States, the majority of whom are Mexican. In addition to the economic reasons stemming from the persistence of wide income disparities, there will be the political reasons due to the succession of revolutions and local wars in the Third World.

While the developed democratic countries will feel bound to keep faith with their moral philosophy by remaining open to immigrants who are victims of political conflicts, they will be faced with a difficult dilemma as regards their general policy of accepting immigrants from different cultures. Encouraging immigration will contribute, in the last decade of the century, to a more favourable evolution of the labour force and the continuation of certain productive activities. On the other hand, such a policy will increase the danger of establishing minorities who are likely to cut themselves off from the rest of the population and be rejected by the ageing indigenous majority. It may be asked whether the developed countries will not, on the whole, do the world community and themselves a greater service by encouraging a slightly positive natural rate of growth of their populations, in order to form societies capable of meeting future challenges and making a positive contribution to the Third World countries' own development.

Migratory questions will be all the more difficult in that, in the context of changing values, many groups will claim the right to a cultural identity and, beyond a certain margin of tolerance, may well encounter resistance from the middle majority.

Protection and development of humanity's common heritage will make cooperation among all countries inevitable.

Protection and development of humanity's common heritage. The number and importance of the questions which concern the management of humanity's "common heritage" will become increasingly evident with the passage of time, even though the definition of this common heritage is not entirely unambiguous. Is it confined to resources which are not appropriated by a State, such as the ocean? Or is it a new way of expressing a phenomenon well known to economists: that of the "diseconomies" that the behaviour of one human group can inflict on humanity as a whole?

Many aspects of the management of this heritage - and not the least important ones - are not included in this report because of its subject (the protection of archeological sites, of works of art, of animal and vegetable species, the protection of the genetic heritage, etc.) but something can be learned from those which have been mentioned:

. the utilisation of space by satellites,

. the influence of human activities on climate, particularly the possible problem of carbon dioxide emissions. What would happen, for example, if in rejecting new sources of energy and pursuing inadequate energy-saving policies, certain groups of countries were to use very large quantities of fossil fuels and seriously affect the climate of other regions of the world as a result.

. sea-bed development, with its consequences for the extraction of natural resources and the protection of the sea against pollution.

What are the lessons to be learned? That cooperation among all States is inevitable in these fields - whether they belong to the East, the West or the South. This statement excludes, in the long term, any profound and lasting breaks between groups of countries, since such breaks can only result in violent crises which re-establish the level of communications sufficient for at least a minimum degree of management of interdependence.

This incursion into three areas on the frontiers of economics provides a further insight into the plausibility of the various scenarios, and begins to trace the outlines of the cooperation needed between States.

The main sectoral economic mechanisms

Throughout this report, energy and raw materials, industry,and agriculture have been seen to be the three main sectors of activity which are the subject of specific problems both between developed countries and between developed and developing countries.

The management of natural resources: energy and mineral raw materials

Energy is a perfect case in point. If consuming and producing countries do not assume their responsibilities and heed the international repercussions of their policies, they may curb growth and plunge the world into a recession.

Energy is a perfect example from three points of view :

. Particularly close relations with other fields. The rate and content of economic growth ultimately determine energy requirements while the amount of primary energy available restricts accessible growth. In the long term, adjustment periods ease, but do not remove, this double constraint. In the short term any sudden rise in the price of oil generated by a supply shortage adds momentum to inflationary surges and causes foreign trade deficits which compel the developed countries to limit their economic activity and intensify export competition. Hence the risk of scenario A - were that scenario to establish itself - being interrupted over the last 15 years of the century by the impact of an inflationary recession.

. A great diversity of situations between countries according to their national resources. Europe and Japan are compelled to develop nuclear energy and to adopt strict energy-saving policies. The United States has a crucial role. It could greatly increase the danger of a world inflationary recession if it does not clarify its long-term aims regarding fossil fuel and nuclear power development, and energy conservation, if it does not adopt vigorous energy policies appropriate to these aims, and if it imports massive quantities of oil and limits its coal production for domestic and foreign markets in order to protect the environment. The OPEC countries may trigger off a crisis due to insufficient capacity if they do not adopt a positive attitude to research and investment for an exportable surplus. The OECD countries must be collectively aware of their responsibilities towards OPEC and the rest of the Third World The developing countries without energy resources have very little room for manoeuvre.

. A strong interaction between national and international aspects. If the main countries, whether they belong to OPEC or to OECD, react solely according to short-term national considerations, they may plunge the world economy into a dramatic situation (with all its possible political consequences).

The scenarios allow some of these problems, particularly those identified by work at the International Energy Agency, to be placed in a broader context :

(i) during the transition to the post-oil era, the development of nuclear energy is essential in order to prevent the third type of crisis (1), i.e. that which will be caused by the depletion of traditional oil. Even if they want to, the developed countries probably no longer have the latitude to organise - in sufficient time - a type of development which consumes little energy and is socially harmonious. When the crisis comes it will be too late to accelerate nuclear energy because such growth must be prepared years in advance.

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(1) Cf. Part I of the report: Energy.

(ii) Energy conservation policies can have significant effects - but need to be formulated in a long term perspective in order not to impede economic activity. This is why they must be applied consistently and vigorously. Here again, each country will depend very much on the efforts of others.

(iii) Coal is going to play a major role - probably from 1985 onwards. The development by the OECD countries of a common coal policy will considerably reduce the risk of an energy crisis. Western Europe and Japan, in particular, need to have access to North American and Australian coal.

(iv) In view of the long transition periods that are necessary, the policies just outlined must naturally be accompanied by vigorous measures to develop new forms of energy.

(v) The development of a consistent policy with regard to OPEC (i.e. a policy which goes further than simply seeking to avoid short-term increases in crude oil prices) has already been mentioned in Part IV. By encouraging long-term investment by these countries, facilitating their economic and social development and the diversification of their economies, the OECD countries can reduce the risk or magnitude of the three types of energy crisis described.

(vi) Mention may be made in passing of the question of assistance to the non oil-producing developing countries.

(vii) Lastly, it is important to maintain consultations between the OECD countries concerning the policies to be adopted in the event of a crisis due either to insufficient extraction capacities or to the depletion of oil resources. The object of these policies would be to reduce the risk of setting off a major inflationary recession in the event of an oil shortage.

The case of mineral raw materials is more complex, but the problems of equality of access and creating conditions for a revival of investment call for governments' constant attention.

In the case of mineral raw materials, the mechanism is infinitely more complex. The variety of different uses, substitution and recycling possibilities give the system ample scope for adjustment - though only in the long term.

One fact remains, however. Whether they are developed or developing, the different countries are seeking more and more to control their own natural resources, either by possessing the ground or by controlling the development. Everything suggests that this is a deep-seated trend which will become more marked in the future. It is the cause of two major problems:

. How will it be possible to prevent discriminatory practice restricting access to raw materials for certain countries? Might it not be worthwhile to consider fixed agreements which would lay down both the commitments that countries agree to respect in their mining legislation and the rules which must be subscribed to by operators?

. What can be done to prevent economic and political difficulties from causing insufficient investment, resulting in shortages in the medium term and, therefore, price increases in excess of the long-term trend? (For private investors, political risks carry considerable weight.) For large-scale mining operations people have suggested multilateral insurance schemes or management companies, with simultaneous participation by private companies, organisations from the country owning the ground and international finance organisations (such as an international bank for raw material development)?

In any event, and for reasons which do not concern physical shortage, the developed countries will have to keep a permanent watch on the situation in the sensitive sector of mineral raw materials.

The redeployment of world industry, in which the market will have to play an essential role (even if it is supplemented by governmental adjustment measures), would be facilitated by the removal of distortions and by improved information.

Redeployment of world industry. The sector surveys and scenarios leave no room for doubt - in the course of the next two decades, there will be an extensive redistribution of world industry, both geographically and between and within sectors. While some aspects of this restructuring relate to deep-seated trends which can hardly be changed, others will depend on the effective reactions of economic transactors and the governments of the countries concerned.

By revealing the complexity and diversity of the situations between industries and within them, the sectoral studies show that market mechanisms must play an essential role in this distribution. Decentralisation of initiatives and competition are indispensable, if future growth industries (in particular the electronics and capital goods industries) are to produce the infinite variety of goods and services demanded by post-industrial societies. The interplay of comparative advantages is equally necessary for Third World countries if they are to develop a large number of production units with access to the world market.

In addition, this play of market forces must not be based on serious distortions in the relative prices of inputs and must not lead to such drastic adjustments that the governments of some countries are obliged for social reasons to lastingly impair free trade.

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(1) Some producing countries rightly point out that guarantees concerning outlets may be the natural counterpart of guarantees of access.

Whence this question: should not the developed countries strengthen their cooperation in this field, widen it to include the newly industrialising countries, eliminate the distortions which undermine the functioning of the market and direct government policies towards measures that will make the structural adjustments more socially acceptable?

It seems clear that the main element in this cooperation should be better information on the detailed outlook for sectors, on input costs in the different areas, on imperfections in markets and on the exact nature of government measures.

More generally and without reverting at this juncture to the question of a concerted approach to structural adjustment policies at national level, governments might have to take a whole series of measures at international level:

(i) For industries in which employment will be falling rapidly in the OECD countries, governments might be forced, as soon as the sectoral crisis begins, to take concerted action to reduce capacities in order to prevent independent protectionist measures. This is in fact already the case as regards steel and shipbuilding.

(ii) But governments will perhaps have to ask themselves whether prevention is not better than cure, and consider examining industrial adjustment problems at the world level by means of regular sectoral studies carried out with the co-operation of major enterprises in the relevant fields. These studies should be used for information alone, and simply encourage industrial and governmental bodies to take preventive measures.

(iii) No doubt there will be varying degrees of structural adjustment of industry in the different OECD countries. Will this have to be taken into account in international discussions and, if so, how?

(iv) Competition between the developed countries, and especially between the USA, Japan and the EEC, in the field of advanced technologies can result in the creation of permanent technological monopolies in some sectors (aircraft construction, for example). Some governments may refuse to accept this situation where it is not in the general public interest or for political reasons to do with national independence.

(v) Sales of capital goods to the Third World are tending more and more to be a trade in which governments intervene. This increases the possibility of advantages being granted that are not economically justified (export credits with a large subsidy element, import commitments by the exporting country, etc.). Inasmuch as sales of capital goods will play a vital role for trade in industrial products, will governments not have to adopt a concerted approach in this matter?

(vi) The multinational companies will continue to be a vital element in world industrial development, but it is not impossible that divergencies will appear between the policies of these companies and the objectives of developed-country governments. Consequently it will be necessary for governments in the developed and developing countries to establish codes setting forth both the rules that the multinationals have to observe and the rights granted to them.

(vii) Lastly, how can the newly industrialising countries be brought into discussions on the prospects of certain industries in order to avoid creating excess capacity without, of course, involving any control of investment either in the developed or in the industrialising countries? Naturally, the procedures employed must not cause world industry to lose its adaptability. The main objective must be to preserve the mechanisms of the market economy by cushioning excessively abrupt consequences that might give rise to governmental measures which jeopardise these mechanisms.

The developed countries will have to harmonize their respective policies in the agricultural sector proper, more than in the sectors upstream and downstream from agriculture. In doing so they should take account of the repercussions on agriculture in the Third World.

Harmonisation of agricultural development. The scenarios complete the analysis of North-South agricultural interdependence in two respects: they underline the sensitivity of agriculture in the Third World to the development strategies adopted and to the operation of world markets, and they outline the various possible patterns of redistribution between major production and consumption areas with the OECD.

These points are established, but it is still necessary to consider the implications of slower growth in agricultural production for the structure of the developed countries.

During recent decades specialisation within the agricultural sector enhanced rather than broke the connections between its sub-sectors and multiplied its connections with the rest of the economy. For example, the beef industry depends on the dairy industry for calves, while both these industries obtain cattle feed from farms concentrating on grain production which in turn are heavily dependent on the energy and agro-chemical industries. Consequently employment upstream induced by agricultural activity is of the same order as employment in agriculture proper, while employment downstream is two or three times greater. The main downstream activities are the agro-industries which process food products, beverages, tobacco, natural textiles and leather. In the OECD area these industries account for from 25 to 30% of the value added by the manufacturing industry, directly employ over 10 million people and indirectly create employment for a further 20 to 30 million in the wholesale and retail trade and in the transport, processing and services sectors. The food processing sector is the most important agro-industry. It differs from many other industrial sectors because, although dominated by multinational enterprises, its output is primarily for the domestic market (except to some extent in the EEC).

In the developed countries food is still the main item in household consumption expenditure, ranging from 17 to 37% if one includes beverages and tobacco, with large differences depending on the income group and country. It is two or three times higher than expenditure on cars, clothing, etc., but it is growing more slowly, at from 2 to 3% per year compared with from 6 to 9% for expenditure on consumer durables.

During the sixties the real growth rate of gross agricultural production in the OECD area was from 1 to 4% per year depending on the country; this rate is likely to fall to around 1% in most countries in the last ten years of the century, at least in the most probable scenarios. Unless there are unforeseen developments, the agro-industries will also decline in the next two decades and industrial biology is unlikely to develop rapidly. Some of the future difficulties were already present in the last 15 years, but they were attentuated by the high rate of growth in the rest of the economy which enabled displaced persons to be re-employed. What will be the problems in the different sectors?

. The most serious problems concern agriculture itself, especially in countries with a structural surplus of certain products.

. Many farms producing these surpluses are over-mechanised. Future increases in the size of farms and changes in the pattern of their output will affect the agricultural machinery sector, which currently has only to satisfy a largely replacement demand in the OECD area and is meeting increasing competition in the markets of third countries. This competition commonly comes from subsidiaries of American multinationals (or from associated companies) established in Third World countries to meet local demand and subsidised in various ways both in OECD countries and in developing countries. Hence there is a risk of a sharp fall in employment in this sector in the developed countries.

. Sales of chemical products to agriculture account for about 10% of the gross value of the output of the chemicals industry in the OECD area. Here the slowdown in demand will be offset by a growing demand from the Third World and should raise no major problems for enterprises which are often well able to adapt themselves.

. The food industry is dominated by a few very big multinationals and is already largely geared to a slowly rising demand. Enterprises in it will continue in future :

- to try to keep major shares of chosen markets by buying up competitors or by sales promotion;

- to introduce highly elaborated products in order to increase value added;

- to diversify geographically within the OECD area and especially in the Third World;

. As regards the distribution of food, it is organised more and more in the form of marketing networks which are relatively independent of the food industry and also market many consumer products of non-agricultural origin which are less affected by the saturation of demand.

Consequently, it is mainly in the agricultural sector proper that the developed countries will have future problems in harmonising their respective policies. In doing this they should take due account of the repercussions on agriculture in the Third World. The problem is how to combine measures for strengthening subsistence farming in the Third World, for liberalising world trade in raw and processed agricultural products, for safeguarding farmers against fluctuations in earnings and for preventing shortages due to climatic hazards. In this wider context the developed countries will have to reconsider which instruments to choose for guaranteeing their farmers a certain income.

Managing the world economy as a whole

The development of international trade may be governed by two trends: a growth in trade within multinational enterprises and increasing government intervention. Procedures for policy co-ordination among governments may prove necessary to facilitate further liberalisation of trade while preventing consequences which would produce government reactions putting the whole system at risk.

Regulation of international trade. If there is moderate growth together with the emergence of some forms of protectionism, international trade might not grow at much more than 6% per year. At the same time there will be radical changes in its pattern as regards the products traded and the shares of the different countries. The scenarios and industry studies have made these changes perfectly clear.

What conclusions can be drawn regarding the machinery for decision-making? Two guesses may be given :

. First the importance of trade within multinational enterprises will continue and will probably increase outside those sectors (such as raw materials) and countries where there is a risk of nationalisation.

. Secondly, the changes will be accompanied by increasing intervention by governments in international trade and growing interdependence between governments' policies for structural adjustment within their own countries and their policies for international trade. There are many reasons for this :

- development of energy policies, maintenance of agricultural policies, and emergence of policies for supplies of raw materials (whether exporting countries' prices or earnings are stabilised);

- growth of exports of capital goods by OECD countries to the Third World (sales of industrial plants and arms) under inter-governmental agreements and compensation arrangements (government intervention will tend to increase because in most developed countries there are only a handful of direct exporters of capital goods);

- role of governments in certain newly industrialising countries such as Brazil, Iran and Algeria;

- increased volume of East-West trade under intergovernmental agreements;

- more aid schemes for converting traditional industries in OECD countries;

- a desire in some countries to channel international trade so as to favour forms of demand connected with the cultivation of new values.

This development in the role of governments is not incompatible with a reduction in other government functions in the developed countries (see Part III), nor with the recognition by some developing countries of the advantages of freer international trade.

Thus the two trends which would affect international trade are both complementary and contradictory. In many cases the government of a country and the multinational enterprises originating in that country will support each other, whereas in other cases governments will try to prevent trade from being internationalised by the activity of such enterprises.

In the absence of any intergovernmental cooperation, therefore, there is a considerable risk of a long-term trend towards a mixture of partial protectionism, direct and indirect, with promotion of exports by governments themselves. In other words, the whole of international trade might develop an oligopolistic structure in which the main transactors would be governments, the multinational firms and diversified trading companies.

In order to avoid an exacerbation of conflicts and loss of efficiency in such circumstances, might it not be necessary for the OECD governments to elaborate certain rules to which governments ought to conform? The purpose of this would be to:

- ensure gradual reduction of the direct and indirect barriers to the movement of goods and services throughout the world, while making the necessary adjustments;

- constrain government action by codes of conduct which exclude certain types of behaviour including behaviour which unilaterally restricts access to certain markets, thereby frustrating the long-term efforts of exporting firms;

- take account of the growing differentiation between the developing countries in order to achieve better integration of the most developed of them into the world economy, and protection of the poorest countries against the influence of the advanced economies. Compared with the present rules, the new ones should be easier to adapt to the trend of the world economy. Might they not form part of ten-year forecasts of the growth of the various economies?

Inasmuch as industrial redeployment and international trade are inseparable, it is hardly surprising that the question of procedure for co-ordinating governments' policies should crop up again. The purpose of these procedures should be to facilitate the extension of trade liberalisation while preventing extreme consequences that might provoke government reactions which would put the trade system itself at risk, this supposes adaptations of an institutional nature.

Improvements in the international monetary system involve simultaneous progress in exchange rate discipline; in the stipulation of reserve currencies; in the conditions for the creation of international liquidity and in governments' conduct regarding national policies. The first two questions are examined in this paragraph and the third elaborated in the next.

Adaptation of the monetary system. During most of the past quarter of a century the OECD area has been living with a monetary system characterised by fixed exchange rates, undisputed acceptance of the US dollar as the reserve currency, and macroeconomic policies. It was possible to maintain this system, at least in part, because of the economic stability of the United States, the predominant economic zone. This had several consequences : indifference towards the United States' external deficit, tolerance of the emergence of surpluses in other countries, and it helped to stabilise trade prices including those of energy. At the national level, fixed exchange rates had important consequences, both positive and negative, for the short-term management of the economies which had the overall effect of moderating inflation rates, thereby consolidating the viability of the monetary system.

It was in the framework of this system that the present productive structures of the OECD countries developed and international trade evolved to form a large part of national incomes. On the other hand, slowness in the adaptation of the exchange rates of different currencies under fixed exchange rates contributed to growing disparities in economic performance and policy objectives and to the continuation of disequilibria which have been a significant feature of the economic situation in recent years. This,along with significant in relative economic strength and excessive creation of liquidity ultimately led to a crisis in the system and abandonment of fixed rates.

A number of problems have also arisen with the generalised floating system since its introduction six years ago. However, given economic disparities among the industrialised countries and considering the foreseeable energy situation, a fixed exchange rate system of the Bretton Woods type does not seem to be a realistic alternative. Nevertheless, as explained later, since there is a tendency for abrupt and sometimes excessive short-term fluctuations of exchange rates under the floating system, it would be necessary to further the co-operative efforts of the countries concerned if such a system is to function efficiently.

Nonetheless, as would be the case with other mechanisms of exchange rate adaptation, the functioning of this system is likely to suffer from certain features of the evolution of national economies, in real and in nominal terms.

In real terms, the structure of production and consumption in the various countries concerned are such that the elasticities of exports and imports in relation to exchange rates vary very greatly from one country to another. At the same time, as was shown in the analysis in Part III, the pressure for structural adjustment, and the rigidity which confronts it, varies from country to country. In addition there is the considerable volume of oil imports, the value of which depends on a single decision as to prices. Under these conditions, the effects of a change in exchange rates on the trade balance could be limited and slow.

In nominal terms, the differences in monetary and fiscal policies, the varying intensity of the conflicts for a share of value added (an intensity which is reflected in the anticipations of transactors) result in widely varying rates of inflation. In addition, short term arbitrage by economic transactors for the currencies in which they wish to hold certain assets leads to short-term exchange rate modifications superimposed on the average real and nominal changes.

Sustained action by governments will be necessary to tighten up exchange rate discipline, improve countries' macroeconomic management policies, and stipulate reserve currencies and conditions for creating international liquidity.

The next paragraph deals with the co-ordination of national economic policies, but two questions remain to be considered. They concern :

- policies to improve the functioning of the floating exchange rate system ;

- reserve currencies and the conditions for creating international liquidity.

(i) The relative advantage of floating exchange rates is that they permit continuous adaptation of the exchange rates of the principal currencies, but onto the mid-term adaptation could be superimposed short-term fluctuations that are not adequately dampened and which arise from shifts in the demand for capital, and external trade. These additional fluctuations are susceptible to having a negative influence on inflation disparities and economic growth. Experience has shown that in a system of floating exchange rates individual countries, whatever their size, cannot afford to pursue a cyclical policy that is widely divergent from that of others. This prompts the question : with floating exchange rates, what combination of micro- and macroeconomic policies and what form of intergovernmental co-operation could reduce short-term fluctuations without preventing the mid-term adaptation. The difficulty of this problem comes naturally from the necessity of avoiding all forms of intervention which translate a short-term under- or over-evaluation of the currency into a permanent feature.

Exchange rate regulation policies will have to take into account the countries that are becoming industrialised. Some of these might tend to maintain their currency permanently under-valued, thus creating chronic trade surpluses.

(ii) Discussion about the monetary system has for many years stressed the need to control the creation of reserves. Several questions have been constantly debated. Does the role of the dollar as a reserve currency confer undue privileges on the United States ? The role on the other hand carries drawbacks which are underlined as soon as the question of the utilisation of other national currencies as a reserve currency is raised. To what extent could special drawing rights play a growing role as reserve currency and be substituted for certain existing reserves ? Does the rate of creation of reserves have an important effect on world inflation ? Does the functioning of the Eurodollar market create reserves, and does it intensify inflationary trends ?

In the future, there will continue to be concern about the level and composition of reserves, which will result in further proposals for reform. The problem will doubtless be less technical than political, and the attitudes of those issuing currencies will probably be more important than those holding them, although in the long term it seems unlikely that any single national currency will constitute a reserve currency.

Three kinds of development may be envisaged :

- The first would be the most ambitious and would be to set up a strongly constructed world institution with wide powers to create an international currency, monitor exchange rates, grant loans to governments with payments difficulties and supervise their economic problems. This course would mean strengthening the International Monetary Fund to make it a sort of World Central Bank. There are many such projects in the literature on world monetary questions. Both the establishment and the operation of such a system would naturally raise more political than technical difficulties. It would be a logical adjunct of the collegial management system assumed by scenario A.

- The second kind of development would be to set up regional sub-systems, each of which would follow on its own account the rules and disciplines inherent in any monetary system. This would not of course regulate inter-regional relationships as regards exchange rates and a common currency for payments and reserves. It belongs to scenario D for protectionism or scenario C for a breakdown between North and South to the extent that it might be the consequence of the appearance of such scenarios. But nothing prevents the existence of regional sub-systems compatible with the types of evolution described for scenarios A and B. Its main danger, unless precautions were taken, would be to materialise latent protectionist forces by splitting up the institutional system of international relations.

- The third kind of development would be a continuing approximation to an acceptable situation thanks to self-discipline in each country strengthened to a greater or lesser degree by ad hoc means. It would involve voluntary "cooperation" with no strong constraints and freely entered into. However, discipline might be strengthened by increasing the role of SDRs compared with the dollar as a payments and reserves instrument, by a commitment not to use exchange rates as a trade weapon and by subordinating countries' policies for correcting imbalances to international requirements. Thi third course seems the most plausible in the context of the moderate growth scenarios B2 or B3.

Lastly - apart from the two questions just discussed and possibly an unnecessary reminder - in the event of an energy crisis of the second or third type described on page 37, we may expect a sharp rise in OPEC surpluses unless there is a concerted allocation of available crude oil supplies. Although the disequilibria resulting from the 1973 price increases have been well absorbed, in fact better than was generally expected, one can ask if the international banking system will be able to again ensure the recycling of cash balances?

In all, from a monetary standpoint, it seems plausible that government intervention may be more important in the future than now but still in the framework of a system of variable exchange rates.

Co-ordination of short-term economic policies and policies for structural adjustment. These two subjects were dealt with at length in Part III.

So far as short-term economic fluctuations are concerned, the developed countries have in recent years replaced a search for a co-operative solution by national policies in which each country tries to find the best strategy for a given behaviour by the others. It is easy to see why the resulting solution is not an economically optimum one, if we consider the differences in external balance of payments constraints between the surplus countries and the deficit countries, or between the United States and the other countries.

This finding prompts two questions :

Why has the co-ordination of short-term economic policy become so important and how important will it be in the future ?

Why is co-operation between developed countries tending to be increasingly difficult, and will this tendency be confirmed in the near future ?

In reply to the first question, an obvious explanation suggests itself : the expansion of the last quarter of a century has greatly increased interdependence (measured by such things as the percentage ratio of exports to GDP) and has synchronised the short-term trends. Even if certain forms of protectionism are developing, this interdependence is likely to continue in future. But the number of significant transactors will be higher in future recessions as the result of the emergence of new financial powers (such as Saudi Arabia) or industrial powers (such as Brazil). How then can they be brought into the preparation of joint anti-cyclical or anti-inflationary policies ?

The second question leads to a number of complementary proposals :

. The decline in the leadership of the United States, which is in the main due merely to the effect of the decrease in its relative economic weight, deprives the system of an implicitly recognised leader.

. The conflict of short-term and structural issues enormously complicates the task of governments, the more so as it strengthens the influence of the following two factors.

. Within each country, the increasing number of national administrations involved already makes negotiation difficult at the national level, and reduces freedom of action at the intergovernmental level accordingly.

. Conflicts are becoming more serious between the demands of domestic policy and the international ones. Governments with small electoral majorities and with elections at frequent intervals are beset with contradictory demands, are swamped in their own bureaucracy, and find that they have less room for manoeuvre.

The whole of the analysis in Part III shows that this situation is not just a passing phase, and that it is likely to persist in the medium term.

Even if technical suggestions may prove useful in more detailed exchanges of views (on such questions as the joint use by the governments of the largest countries of an interconnected set of consistent short-term models, and the simulation in that system of the effects of those countries' policies), it goes without saying that nothing can take the place of a political will by governments to co-operate. The possibility of such political will depends on broader public support.

It is doubtful whether such support can be obtained for mere short-term management. The question therefore arises whether there should not be some rethinking of economic co-operation between the OECD governments, including in it the medium term - a horizon which throws some light on structural incompatibilities - and structural adjustment policies. This is the reason for the title given to this sub-section.

The sectoral studies have already thrown up many political issues. Clearly, however, behind the sequence of the scenarios, and behind these issues, is one question which embraces all the others, that of co-operation between governments in managing worldwide interdependence.

4. THE MANAGEMENT OF INTERDEPENDENCE

Likely trends and possible breakdowns throw light on the strategies and strong points of the different groups of countries and show the need for renewed international co-operation.

The scenarios and sectoral analyses throw additional light on the characteristics of future interdependence. It now remains to draw the conclusions from that examination. Factually, by bringing to light the likely trends and possible breakdowns; and at the policy level, indicating the strategies available to the various groups of countries, and seeking forms of intergovernmental co-operation that will help resolve the conflicts resulting from interdependence.

The probable trends

As the scenarios were described in Parts III and V, a view emerged as to their probability. We must now state this, with all the necessary reservations:

If there is no major shift in government policies in the North or South and no cumulative breakdown occurs, the most likely trend might be a Scenario B3-type, with features of B1 that are more accentuated in certain geographical areas.

High growth in the developed countries will, in the absence of vigorous and coordinated government policies, encounter severe national and international constraints. Taking into account internal conflicts over the division of national incomes and the social fragmentation due to change in values, the success of such policies is moreover not guaranteed. We may thus be sceptical of the chances of their being adopted simultaneously by the governments of all the main developed countries.

At the other extreme, the emergence on a world scale of the conditions for further growth appears all the less likely as the changes in values will not be accompanied by the appearance of significant social groups, and will undoubtedly be slow. The new values will nonetheless gradually influence the shape of growth, and some developed countries may be obliged to limit the extent to which they open their economies to the world, in order to be freer in choosing their objectives.

It has to be admitted that the moderate-growth scenario has some plausibility - with two reservations. Firstly, the assumption of convergent levels of productivity stand up very badly to historical comparison and to an analysis of the internal dynamics of the advanced industrial societies; therefore, if a choice has to be made, it is rather for a divergence of the long-term trends of productivity in the developed countries. Secondly, moderate growth does not go easily with a high degree of liberalisation of trade. In this form, the scenario is unstable, and logically leads to various forms of protectionism.

Too many countries in the North as well as the South have so much to lose from a breakdown between the developed countries and the Third World that it is unlikely that it will happen in an extreme form. Co-operation between developed countries, together with partial protectionism in those countries, may however be met by co-operation between Third World countries and partial protectionism in those countries, may however be met by co-operation between Third World countries and partial protectionism in those countries. One group is then in an essentially strategic position, namely the industrialising Third World countries, which are the leading claimants in the South and the potential partners of the developed countries in the North. For the countries of the South, the question of a choice of development strategy is the point at which the questioning of the North about new growth is being directed. It leads to the same conjecture: that it is not altogether likely that the whole of the Third World will adopt policies giving priority to basic human needs, even if some countries were to commit themselves resolutely to that aim.

The last group of scenarios showed that extreme forms of protectionism would arouse resistance, both in the developed societies and in those Third World countries that were incited to trade on highly privileged terms with one of the main centres of the North. This in no way excludes the possibility, however, that there will be some increase in trade barriers between the main OECD areas, and in preferential relationships, especially where investment is concerned, between the EEC, the United States and Japan and some areas of the Third World.

A possible trend, but one to be emphatically avoided, could arise if there is no major shift in government policies in the North and South and no cumulative breakdown occurs. It is the following: the present slow or moderate growth of the developed economies continue for some 15 years with a continuation of structural unemployment. Co-ordination of short-term economic policies continues to be inadequate, and structural adjustment goes on in a haphazard fashion under cover of direct protectionist measures directed against imports from other industrialised regions and from the Third World. Some countries show greater flexibility in adjustment, notably Japan, and their productivity increases without the productivity of any other country constituting a kind of ceiling. Governments have difficulty in arbitrating between the traditional demands, which continue to be pressed, and new demands from active minorities. Only a few countries opt more definitely for the new growth, and control some of their external trade to make it possible to develop in that direction.

Differentiation continues in the Third World countries. In the poor continents, some countries attempt reformist or radical development strategies to improve basic needs satisfaction in all social groups, but these attempts are not certain of success. The Third World also tries to organise co-operation within itself, but succeeds only in a very partial fashion, the more so as close links continue to exist between Latin America, North America and Europe; between Africa and Europe; between the Middle East, the United States and Europe; and between South-East Asia and Japan, for cultural, political, military and economic reasons.

Despite the semi-protectionism which exists within the North, between the North and the South, and in the South, the redeployment of economic activity throughout the world continues intensively, and the newly industrialising countries increase their trade with the developed countries. Without becoming really integrated in the world market, they depend increasingly on it.

In all, to use the jargon of this report, this is a Scenario B3, with sections of B1, more accentuated in certain geographical areas, and some features of C and E.

Such an image, though possible, is nonetheless extremely disquieting :

. Peoples are showing unsatisfied aspirations: the governments of the developed countries have to meet claims of an ageing population which is at the same time making new demands and showing great need of security; while in the Third World, absolute poverty is only disappearing slowly in terms of relative percentages.

. Harassed by the multiplicity of problems to be solved, caught up in the many conflicts to which interdependence gives rise, governments are not managing to establish regular co-operation on a basis of mutual trust. Many questions are settled late, and the solution represent in the main what economists call non-co-operative equilibria.

This prompts the question: is not the corresponding sequence unstable? Might it not give rise to breakdowns of various origins?

The possible breakdowns

With reference to the Scenarios, various kinds of breakdown may occur: breakdowns in energy supplies, socio-political instability in the Third World, a decline of democracy or weakening of the State in the developed countries, and a spreading of protectionism, to mention only the main ones., Faced with these various alternative futures, governments must improve the probable and manage the unforeseeable.

Some people will consider that the cone of possibilities explored by the scenarios is too narrow, but this is due to three causes: deliberately discarding certain assumptions as being too extreme (as explained in Part II), the slightness of the effect in macro-economic terms produced by profound structural changes, and a probable overestimate of the speed at which the various economies would absorb the shocks.

Moreover, it is in relation to this cone that discontinuities may appear, which will be all the more pronounced in that the aim of governments' policies must be not only to facilitate the emergence of a certain type of long-term development, but also to manage the unforeseeable by making the societies they look after less vulnerable.

As in the case of any accident, the discontinuities may occur because of a particular conjunction of events that is difficult to foresee, causing a snowballing of actions and reactions which generates an irreversible trend. Hence the difficulty of describing such crises, but it is at least possible to isolate some of their potential components:

(i) First place must go to energy. At the start revolutions in some OPEC countries and/or insufficient investment by them to increase their extraction capacity, together with weak OECD country policies for nuclear energy, coal or energy conservation. At the finish, an inflationary recession of the world economy, hitting some developing countries hard, increasing unemployment in the developed countries and causing social unrest and other kinds of breakdown in those countries. This type of crisis is not only for the end of the century, but could occur at any time in the next few years.

(ii) Physical resources may also be the cause of other kinds of crisis. Linked with climatic hazards, agricultural difficulties can hit areas in the Third World severely and lead to widespread famines in Sub-Saharan Africa and Southern Asia. Access to sensitive raw materials like chromium can be suddenly cut off and jeopardise whole sectors of industrial activity in the developed countries. Inability to find an answer to the effects of carbon dioxide on the climate may enforce limited use of fossil fuels.

(iii) The extent of the problems which societies in the Third World will have to face will make most of them highly unstable; OPEC countries whose oil fever is undermining their social structures and whose governments are facing difficult choices in preparing for the post-oil era; industrialising countries in which income distribution is highly unequal; poorer countries whose problems are difficult to solve and where stability depends for the time being on attitudes of resignation. The spread of military power and perhaps the proliferation of nuclear weapons will stir up regional conflicts without improving internal stability. To these factors will be added ground swells such as the rewakening of Islam from Uzbekistan to Mindanao and in the heart of Africa. More generally speaking, many developing countries will remain tempted variously to join the present international economic system, to disengage themselves from the North and to support a bureaucratically organised international economy. Thus breakdowns whose interdependence will strengthen their impact on the developed countries.

(iv) Within some developed countries two kinds of breakdown are conceivable under the pressure of external interdependence and internal fragmention:

. A decline in democracy, with the State growing strong in order to negotiate more successfully with other governments and to arbitrate between social groups by making the structural adjustments bearable. Activities in the countries concerned would then be redistributed by the use of planning systems.

. At the other extreme, a faster movement towards new values and an increasing challenge to the State in internal affairs. But if the internal changes were too rapid for the international context, this criticised State would be asked, paradoxically, to ensure strict co-ordination of external actions in order to allow original forms of social organisation to develop.

(v) Owing to the increasing incompatibility of the developed countries' economies, these breakdowns might well lead in their turn to protectionist movements with fragmentation of the world economy and a tendency for world trade to become bilateral. This is a further reminder of the risk of a shift from the B - B3 scenarios to a mixture of Scenarios C and D.

(vi) There still remain the risks of an upset in the balance between the USSR and the United States, with the USSR observing and exploiting the breakdowns within the Third World, while trying to control the development of Eastern Europe, and with Chinese policy liable to introduce a new element of instability.

Faced with these various alternative futures it is for all governments, and not only those of Western developed countries:

- to create conditions in which the most favourable developments can occur, and

- to reduce the risks of breakdowns and procure the means of coping with them if they should occur.

In other words, they must improve the probable and manage the unforeseeable.

The strategies and the strong points of the various groups of countries

If the situation is reduced to its barest essentials, the patterns of world economic interdependence is woven by eight countries or country groups : the United States, Japan, the European Economic Community, the USSR, the OPEC countries, the countries in the process of industrialisation, China, and the rest of the Third World.

The United States: This country's behaviour will be as important in the next quarter-century as in the last, but in quite another fashion. It has become only the leading world power among others, with a steadily declining share of world income, and no longer has an indisputable lead in productivity. Furthermore individual attitudes and forms of organisation will have to adapt to the era of interdependence. In short, the United States has ceased to be exceptional. Nonetheless, it will still have a considerable number of strong points: quite a low degree of dependence on the world economy (see scenarios C and D), an undeniable lead in basic technologies, powerful multinational firms, large natural resources, a strong agricultural sector, a currency recognised as a reserve currency (even if this entails disadvantages), not to speak of the military position.

Vis-à-vis the USSR, the other developed countries and the Third World, the United States can still choose from a wide range of strategies: isolation; strict defence of its short-term interests; an attempt to regain its past leadership; or active cooperation with the main OECD industrial countries in the joint management of worldwide interdependence with an open attitude to the Third World. In the light of the report's analyses, only the last-mentioned alternative would constitute a real response to the challenges of the future.

The growing importance of Japan rests on quite a different basis. Its strengths are community spirit, a great ability to process information, to decide and act collectively, and an undeniable ability to make structural adjustments. These are essential strengths in an era of interdependence. It has geographical advantages in the proximity of China and South East Asia, but weaknesses that are no less important - no energy or raw materials, and an agriculture with limited possibilities. There are also specific problems in such matters as housing, ageing of the population and national defence, and the range of possible policies is reduced accordingly. Japan has a strong interest in the maintenance of free trade, the development of relations between the developed countries and the Third World, the intensification of its links with China and South East Asia, the continuous adaptation of its productive system, especially from the standpoint of saving raw materials and energy, and cooperation in the management of interdependence.

With the rise of Japan, the development of South-East Asia (excluding Indonesia) and the new policy of China, an area is taking shape in the Far East which might, in the second quarter of the 21st century, become a centre of the world economy.

The case of the European Economic Community is more difficult. With problems of unemployment, inflation and industrial redeployment, low growth will affect the EEC countries differently because of the great differences in structure and social divisions. Their structural adaptability is likely to be low, especially if account is taken of national and regional features, conflicts between the decision-making processes at the national and Community levels, and the ageing population of all the countries and particularly of the most prosperous country, the Federal Republic of Germany. In these circumstances there can hardly be any other strategy than to take the narrow path in search of a consolidated internal common market, keep open frontiers insofar as the resulting adjustments are acceptable to all partners, develop relations with the Third World, and improve decision-making procedures within the present or enlarged Community.

Because of the terms of reference of the project, little attention has been given to the USSR and East European countries in this report, but two significant probabilities emerge. Even if these countries' trade with the OECD area and the Third World remains limited, it will reach a level where they will have a considerable influence in world industrial competition. Allowing for the economic prospects of the OECD area, the Third World and China, the USSR's share of world income may reach its peak around the end of the century.

Whether or not they are oil producers and members of OPEC, the newly industrialising countries (those, for example, which may reach the income threshold of 1976 US$ 2,500 per head per annum in the year 2000) are of fundamental importance for future equilibrium. They will represent the middle class of an evolving world society, with rich and poor countries, and will be attracted both by integration in the world market and by the assertion of their individuality as members of the Third World. Their advantages and weaknesses were described at length in Part IV.

There remains the Third World of suffering humanity, whose most urgent problems will be only partly resolved by the end of the century. The analyses in Part IV can easily be transferred to a worldwide context. The weakness of many of these countries is very great. Their strength lies in the future, and in their conviction that one day each individual will carry equal weight in decisions affecting humanity as a whole.

This is admittedly a very restricted survey of the positions of the main countries and country groups, but it does suggest the possible shape of increased intergovernmental cooperation.

The ways to cooperation

The difficulties resulting from the conjunction of

The difficulties resulting from the conjunction of interdependence and the endurance of the nation-states can be resolved only by giving a new dimension to international cooperation.

interdependence and the endurance of nation-states can only be resolved by giving a new dimension to international cooperation. This presupposes a political will, overall and sectoral cooperation with the main countries concerned, the desire to make international markets function better, the realisation by each country of its international responsibilities, and finally an institutional effort.

Let us try to find some guidelines for strategies that will be needed :

(i) The extension of cooperation requires a political will on the part of governments, which will not exist in the democratic countries unless the mass of citizens becomes aware of the problems of the future and understands that greater decentralisation at the national level is not in any way incompatible with greater intergovernmental collaboration.

(ii) The management of interdependence calls for overall cooperation, at least among the major OECD countries such as the seven which participate in the annual summit. This cooperation must apply simultaneously to the short, medium and long term, and to the interaction between the various fields of activity.

(iii) Increased cooperation is vital in a number of sectors which cannot be treated separately: management of natural resources, co-ordination of economic policies, reform of the international monetary system, trade and industry issues, North-South relations.

(iv) More generally, cooperation must, with an open approach, and, whatever issues have to be resolved, involve the main countries concerned. In preparation for the future, could not the OECD Secretariat gradually bring the newly industrialising countries into its joint activities?

(v) Cooperation should have the aim of making the international markets function properly at a time when governments are becoming, directly or indirectly, important transactors. It must not lead to a bureaucratic management of the world economy.

(vi) In order to succeed, cooperation must mean that each country accepts its own responsibilities at the national level, minimising the diseconomies that it is liable to inflict on others by inadequate policies on inflation, energy conservation or structural adjustment, to mention but a few examples.

(vii) Lastly, the management of interdependence presupposes an institutional effort, both by the major countries and by the international community as a whole.

To deal with the problems described in the various parts of this report (changes in values, preoccupation with social justice, structural changes, the growing role of governments in economic and social activity, increasing complexity of the governmental machine, pressing demands for greater participation in decision-making processes and the considerable impact of external factors), the governments of the developed countries will be obliged to adapt their national institutions. The solutions will admittedly differ from country to country but the objectives will in the main be identical :

. to provide citizens with better information, and to try to create the basic minimum of political consensus needed for any government action;

. to take into account the long term when devising policies;

. to control the growth of bureaucracy and decentralise government actions to a greater degree;

. to ensure better co-ordination of action taken;

. to strengthen the links between national and international policies.

For the countries of the European Economic Community there is also, naturally, the difficult problem of efficient functioning of the machinery of a Community of nine or twelve members.

At the international level, the last quarter of a century has seen the growth of a large number of intergovernmental institutions: agencies of the United Nations Organisation, and specialised or regional organisations.

Under the combined influence of the pressures of national bureaucracies and their own internal dynamics, these second-remove bureaucracies suffer on the whole from progressive sclerosis. It is not all that surprising that by and large their efficiency seems to increase the further removed they are from governments and the more responsibility they have for taking practical action. So because there is no common resolve to reorganise these bodies, governments set up one organisation alongside another, sometimes in the same field, hoping in this way to bring back imagination and efficiency. This is a well-known procedure, widely employed at the national level. Alternatively, they deal informally with the most difficult issues in meetings held outside the international organisations.

Nevertheless, provided that something is done to make them less bureaucratic, and there is the political will on the part of governments, the international organisations are the ideal framework in which to devise a way of managing world-wide interdependence.

What is asked is not to increase the number of organisations but to define their functions more specifically in relation to one another, to adapt government membership to trends in the world economy and to improve the way these organisations operate, notably by establishing clearer assignment distinctions as between collecting information, evaluating policies, serving as a forum for negotiations, managing programmes and restoring to the executive bodies a real power of initiative.

Furthermore, it might be useful to consider setting up international organisations which would be non-governmental but financed by governments (1). The greater functional flexibility of such organisations would be more suited to studies, research, information and informal exchanges of views. The multinational firms or the trade unions could be brought in more easily on certain questions. Some of the present activities of the international governmental organisations could be transferred to them, and the executive centres carrying out common policies directly, or preparing negotiations, could be lightened so as to consist mainly of high-ranking civil servants in sole contact with responsible levels in the various countries. This would increase the likelihood that interdependence could be efficiently managed.

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(1) An example of this is the International Institute for Applied Systems Analysis, grouping 17 Eastern and Western countries.

In any event, if the developed countries, with an open mind towards the Third World, wish to equip themselves with the means of non-bureaucratic co-operation, they will have to pay constant attention to the evolution of the international institutions.

CONCLUSION

The report's message is intended to incite awareness and action. The message has three main components:

- *prospects;*
- *critical issues;*
- *recommendations.*

Right at the beginning of this report, in the closing words of the introduction, it was stated that the report's purpose was not to convey a message of pessimism or optimism about the future, but to incite awareness and action. What then is the content of the message, for the developed societies and for the governments that represent them, that emerges from this prospective analysis? It has three main components namely, prospects, critical issues and recommendations. A preliminary comment is required on each:

- The prospects are not forecasts but an investigation of the range of possible futures, which by giving some insight into potential problems, will hopefully improve our ability to master the future and adapt to the unpredictable. It should be remembered that INTERFUTURES, although keenly aware of the social and political issues, has concentrated chiefly on the economic dimensions of the world of tomorrow.

- In the examination of critical issues, the emphasis is placed on international co-operation, North-South relations and the domestic problems common to the advanced industrial societies. On the other hand, because of the project's terms of reference and the limited amount of time available, the questions specific to each developed country could not be tackled and East-West and East-South relations have not been dealt with in depth. This certainly does not mean that these subjects are less important. However, we do not think that these relative omissions impair the validity of the conclusions.

- Finally, the recommendations are of two kinds. Some set out general guidelines for possible strategies, while others take the form of technical proposals on specific subjects.

Some readers will rightly ask what are the objectives that give the strategies outlined their relevance. Any attempt to identify these objectives in detail would have been a highly arbitrary exercise. Human societies are at all times the seat of manifold, partial and contradictory aspirations, while governments, as institutions, are very often loath to formulate consistent sets of objectives. Furthermore, it is quite clear that the long-term objectives held most desirable will vary not only between OECD countries, but also according to the specific circumstances of each period. However, these conclusions do hint at a few overall objectives of importance to all advanced industrial societies:

- the maintenance or reinforcement of the political and economic security of these societies far into the future with regard to both their external relations and their domestic situations;

- reduction of their vulnerability to more or less unpredictable events that may occur at any moment;

- increased efficiency of the world economy by improving the functioning of markets and the other institutions;

- reduction of inequalities in the distribution of incomes and power, precisely to the extent that these inequalities call into question the dominant value systems in the developed countries and possibly compromising their long-term security.

1. THE PROSPECTS

The bulk of the prospects brought out by the report can be grouped according to its four complementary approaches:

- *man's relations with the ecosphere;*
- *the advanced industrial societies confronted with change;*
- *the future of the developing countries;*
- *trends in international economic relations.*

These prospects can be grouped according to each of the four complementary approaches used in this report: mankind's relations with the ecosphere, the industrial societies confronted with change, the future of the developing countries, and trends in international economic relations.

Mankind's relations with the ecosphere

(i) The human race is going through a period of unprecendented demographic change which will probably take it to a stationary population of about 11 to 12 billion a century from now.

(ii) From now on man will have to concern himself more and more with the impact of his activities on the environment in all its forms.

(iii) However, economic growth may continue during the next half-century in all the countries of the world without encountering insurmountable long-term physical limits at the global level.

(iv) This reassuring diagnosis by no means rules out the emergence, during that period, of problems due to constraints of physical availability, economic and social constraints, socio-political challenges or to a combination of these. These problems and challenges include:

- the introduction in agriculture of resilient long-term agro-ecosystems that will prevent the destruction of arable land, increased resistance to insecticides or water pollution;

- a profound change in the structure of energy relations particularly those concerning the sources of primary energy, so that a constant balance can be maintained between energy supply and demand without excessive price rises;

- for raw materials, the development of new technologies; guarantees of equitable access to all resources; the settlement of juridical and institutional questions about the exploitation of resources which cannot be appropriated at the national level;

- development of research on climate and improved protection against toxic products.

The industrial societies confronted with change

(i) Even if there are no absolute limits to growth due to lack of resources or insufficient innovation, the industrialised countries are likely to experience more moderate rates of economic growth. This may be the result of both external uncertainties (emergence of a multipolar world, difficulty of the energy transition, existence of monetary problems) and internal characteristics (lower estimated profitability of investment, sensitivity to inflation). The latter will probably reflect a certain institutional sclerosis, changing values and the reduced ability of governments to master the more and more complex elements of their policies.

(ii) Aspirations to new life styles will develop, notably as with regard to the allocation of time, participation in decision-making processes, work and leisure, the family, culture and ecology, though it is not possible to say whether one dominant life-style will emerge or to what extent it would represent a change in demands or a more radical change in values.

(iii) Four great technological adventures are under way: in electronics (teleprocessing and automation); in biology, with a whole array of effects on health and on agricultural and industrial activities; in energy production, with the development of alternative major sources of primary energy; and finally in the use of the oceans and space.

(iv) The developed societies are on the verge of major structural transformation due to pressures from demographic changes, the changing pattern of final demand, the increasing cost of exchanges with the physical environment and, above all, the changes in the competitive positions of their economies. They will have to overcome the rigidities associated with the labour market, with the different forms of government intervention and with foreign trade.

(v) The two major institutions for the production and distribution of goods and services, the market and the Welfare State, will encounter difficulties. The relations between the two will experience deep transformations at national and international levels while it is quite difficult to foresee a unique or dominant direction for such an evolution. However, it may be ventured that the growth of public expenditures which has marked the last thirty years could slow down and that the distinction between private and public production sectors could become more blurred.

(vi) The energy crisis, moderate growth and the development of foreign competition will create a constant tug-of-war between the acceptance of an outward-looking stance and the temptation to withdraw.

The future of developing countries

(i) The developing countries, which will have a combined population of about 4.5 billion by the end of the century, will become increasingly diversified as time goes on.

(ii) The middle-income developing countries have excellent growth prospects if the advanced industrial societies provide them with markets and part of their financing requirements. One group of these countries may have an average per capita income in excess of US$ 2,500 (at 1976 prices) at the end of the century and a combined population of 760 million.

(iii) On the other hand, the situation of the poorest developing countries will improve only very slowly, and the countries with per capita incomes of below or about US$ 300 (at 1976 prices) at the end of the century might well have a combined population of 1,650 million. Although their proportion will decline sharply, the actual number of people in a state of acute poverty may not decrease appreciably from the present number. For the poorest countries, aid will continue to be an important factor in filling the gap between internal savings and required investment as well as meeting the most urgent consumption needs.

(iv) Growth of the non-oil producing developing countries will depend very much on the availability and price of energy.

(v) The food dependence of the developing countries is likely to increase on the whole, though without creating insoluble problems at the level of effective demand. However, progress in subsistence farming, which is often held back by industrialisation objectives will remain (or become) a central area of conern in a large part of the Third World.

(vi) Industrialisation will make spectacular headway in certain regions of the Third World, but the use of technologies suited to the economic and social conditions in each region is important in order to increase employment, improve income distribution and permit the creation of mass consumption markets.

Trends in international economic relations

(i) Economic, ecological and cultural interdependence is likely to increase during the latter part of this century. This will have beneficial effects but it will also create new vulnerabilities. Difficulties will arise from the conjunction of this interdependence with the maintenance of nation-states.

(ii) The respective economic weights of the different nations and groups of nations will change both within the OECD area and between that area and the Third World. The United States' exceptional assets will ensure that it retains a role of the first magnitude, but the role may change because of its declining share of world income. With Japan's increasing prominence, the industrialisation of South-East Asia and China's new policy, a zone may emerge in the Far East which would be one of the important centres of the world economy in the second quarter of the 21st century. The European Economic Community's share in world income will also decline and European countries will experience difficult problems of organisation and structural adjustment. The relative power of the USSR might reach its peak towards the end of the century. Whilst the OPEC countries and the industrialising countries of South-East Asia and Latin America will become major elements of the world economy, South Asia and Sub-Saharan Africa will remain, for the most part, poor areas.

(iii) The internationalisation of industry will constitute one of the major aspects of interdependence. In the developed countries, the interaction between industry and research, plus the complementarity between industry and services, will progressively alter the concept of industrial activity; a new generation of impetus-giving industries will replace those which were responsible for post-war industrial growth. Keener competition seems probable between the most developed countries to retain or reach ascendancy in the high technology activities. Under the auspices of the multinational enterprises (private and public) the segmentation of production processes and the concentration of certain activities will continue at the level of major regions or at world level. The Third World (China included) might account for 23 to 25 per cent of world industrial production by the end of the century.

(iv) The trend of international trade will be very sensitive to growth rates, the nature of North-South relations and the decisions of the main countries on whether to opt for more extensive liberalisation or for a neo-protectionism. The share of the Third World (excluding China) in international trade might rise from 12% at the beginning of the 1970s to 18-22% at the end of the century. The increase in multinational companies' trade and the growing intervention of governments may necessitate new forms of concerted action and co-operation to facilitate the extension of free trade in a manner that does not provoke government reactions which would compromise such trade.

In brief, the most likely trend is one of moderate growth in the developed countries (with a tendency for productivities to diverge and the incorporation of certain elements of new growth), differentiation of the Third World, adoption of policies to subtly promote national economic activities by measures with neo-protectionist features directed North-North as much as North-South. Such a trend is far from satisfactory in numerous respects. Furthermore, a number of crises are conceivable: first, with regard to energy supply, local or regional crop failures due to climatic hazards, revolutions in Third World countries and wars between some of those countries; second, but with less probability, a cumulative development of protectionism, crises concerning the role of the State in the developed countries, and so on.

An awareness of the critical issues is necessary to enable governments, collectively and individually, to ameliorate some probable trends and give themselves the means to manage the unpredictable.

2. THE CRITICAL ISSUES

Governments should give priority to overcoming critical issues in four areas : the energy transition; the developed countries search for new policies; common efforts for the Third World's development; new forms of international co-operation.

The issues that would seem to warrant the prior attention of governments arise in four areas:

(1) the energy transition;

(2) the search by developed countries for national policies adapted to the new context;

(3) common efforts for the development of the Third World;

(4) new forms of international co-operation.

The energy transition

The present energy situation is a constant threat to the prosperity of the world economy.

Here the facts are astoundingly simple. The situation of the world economy will be precarious until the proportion of oil in the world supply of energy (and particularly the proportion of present OPEC oil) has been substantially reduced. Energy conservation, nuclear power development and use of coal are the three avenues to pursue vigorously and simultaneously, while preparing for the emergence of new energy forms which may become available in the longer term, like solar energy, and without losing sight of safety and ecological considerations. In the energy field each country should intensify its national efforts, whilst striving for co-operation between oil-consuming countries and between those countries and the oil-producing nations.

The search by developed countries for national policies adapted to the new context

The industrialised countries will have to devise solutions to the twofold problem of inflation and unemployment, whilst adaptation to change will assume crucial importance in the perspective of these countries' relative decline.

First it is worthwhile repeating a point that has already been stressed. The developed world is not homogeneous. The problem of the present and of the future seem to be seen in different ways in Japan, in certain countries of Western Europe, in Canada and in the United States. Admittedly, the considerations which close Part III of the report have a relevance for the OECD countries as a whole, but they have to be interpreted very much in accordance with national situations.

In the future the governments of developed countries will be obliged, more than in the past, to formulate their policies with due allowance at national level for the emergence of new values and new social demands, the objective of sustained non-inflationary growth and full employment, and the need for adaptation to structural changes.

It will be necessary to combine the following objectives:

- *restoring growth;*
- *accepting structural adjustment;*
- *rejecting trends that create outcasts from growth;*

Growth will not only be subject to macro-economic constraints both domestic and international, like inflation or balance-of-payments difficulties, but will also encounter deep-reaching structural problems. These problems may result from a process of social fragmentation that is partly due to changing values, but also arises from the interaction of pressures on production structures with the rigidities of those structures. Hence the danger of a persistence of moderate growth not offset by the change in values and in the content of national production that would make it acceptable. In this context the problem of employment will continue to be a major concern.

- *being responsive to the demands of those groups likely to shape the future;*
- *helping to build up co-operation between developed countries.*

Consequently, as outlined in the report, three extreme strategies could be envisaged: a strategy giving absolute priority to economic growth, with draconian efforts at structural adjustment; an essentially defensive strategy aiming to cushion the social consequences of the international economic situation; a strategy aiming to accelerate the evolution of the economy and society in accordance with the new values.

Yet none of these strategies is risk free: a widening of social and economic inequalities for the first, sclerosis for the second, a premature utopia for the third. Hence the need to combine elements of the three strategies around the guidelines already described:

(1) restoring economic growth, not as an aim in itself, but as a means of facilitating the achievement of society's quantitative and qualitative objectives.

(2) accepting structural change at a rate that is socially tolerable and politically possible, which implies giving temporary status to all individual or sectoral measures designed to facilitate the adjustment;

(3) rejecting trends which exclude certain groups from the long-term benefits of growth, which presupposes attention to the problems of regions, minorities and disadvantaged persons and, in the matter of employment policies, developing special programmes for young people, women, handicapped persons, etc.

(4) being responsive to the demands of those groups likely to shape the future, not in deference to changing fashions, but in order to prepare for the introduction of profound changes; through painstaking consideration of the social demands dictated by changing values and emanating from minorities;

(5) contributing, at national and international level, to increased co-operation between developed countries, since sustained non-inflationary growth, higher levels of employment, socially acceptable structural adjustments and changes in the content of social progress will not be achieved without stronger international cohesion.

But the concrete form and the relative importance given to these different approaches and the impact which their implementation is liable to have on the world economy would differ widely from country to country.

- In the medium-term, raising of the growth rate is a more acute problem in Europe than it is in Japan or the United States.

- Structural adaptation will encounter stronger resistance in Great Britain, Italy or France than in the United States, Germany and, above all, Japan.

- The elimination of pockets of underdevelopment and minorities partially excluded from the benefits of growth is a less serious problem for Japan than for other OECD countries.

- Susceptibility to new values seems greater in Scandinavia than in most countries of central and Southern Europe, and there are also differences on this score within the same country, as between the east and the west of the United States.

- Finally, the knowledge that the peoples of the developed countries have of the external world and their sensitivity to international issues or to the international aspects of domestic policies vary considerably from one country to another.

In their international co-operation, the governments of developed countries will therefore have to be particularly alert to the differing intensities of the difficulties encountered by the economies of those countries. For there might be a critical threshhold beyond which these differences would compromise the developed countries' ability to maintain a wide open-trading area among themselves.

But behind the economic difficulties from which certain developed countries are suffering, there is the absence of a grand design that represents the consensus of society. The existence - implicit, of course - of such a design played a vital role in the success record of the quarter-century following World War II: whether it was the United States, custodian of world order and purveyor of an ideology in which the developed countries believed; or West Germany, France and Italy, determined to rebuild their future; or Japan, for which economic growth was the means of recovering its sense of identity and its role on the World scene. These schemes no longer have any significance - partly because they have been achieved.

Can a new scheme come into being? At all events it will not be brought into existence by legislation, nor by a political party's programme, but by the complex alchemy which governs the evolution of societies. It will have to be sufficiently broad to be the rallying point of widely differing beliefs as to how society should be organised. It cannot be confined to purely national objectives since, in these days of interdependence, the advanced industrial societies can no longer plan their futures in isolation and independently of the rest of the world's development.

Common efforts for the Development of the Third World

The third world's development is in the interests of the developed countries. Developed and developing countries should together work out

A more harmonious development of the Third World is in the long-term interests of the OECD countries and this development will play a central role in relations between developed and developing countries during the next twenty years and beyond.

Hence the importance, for the developed and developing countries alike, of working together to produce and pursue strategies of mutual interest. These strategies should be based both on present reality in all its different aspects and on the concept of a future that may transcend the present conflicts.

strategies built around four guiding principles :

- *removing obstacles to the efficiency of the international economic system;*
- *improving the distribution of incomes within and between countries;*
- *devising operations that can be carried out jointly by groups of developed and developing countries;*
- *participation in intergovernmental institutions.*

These strategies, which are but one aspect of the management of interdependence, might be built around the following principles:

(1) Removing obstacles to the efficiency of the international economic system, whether these obstacles are due to the policies of the developed countries, to those of the developing countries, to market structures, to the behaviour of certain economic transactors, etc. Indeed, a great number of these obstacles are detrimental to the Third World countries, especially those in the course of rapid industrialisation.

(2) Improving the distribution of incomes within and between countries - three ways can be suggested.

- by increasing transfers for the purpose of meeting basic needs and especially those to the poorest countries - priority being given to the development of their agriculture and the establishment of an acceptable balance between agriculture, industry and services - and seeing to the quality of those transfers (in terms of regularity and conditions of access);

- by being particularly heedful of the "diseconomies" which the workings of the world system might inflict on these countries;

- by making every effort to prevent situations in which relative prices movements or the technologies implemented limit the growth of employment in the world and help to maintain or to accentuate the inequality of income distribution in certain developing countries.

(3) Devising operations that can be carried out jointly by groups of developed and developing countries. These operations might be in key areas of interdependence like energy, raw materials, agriculture, industry, science and technology and financial flows, and might involve either developing countries with similar problems or countries in the same region.

(4) Progressively developing, as the world economy changes, participation in the appropriate intergovernmental institutions, while taking steps to ensure that enlarged membership does not reduce the efficiency of the institutions.

However, these joint efforts presuppose a continuing development of the research that will afford a better knowledge of the situations of the different Third World countries and of the interactions between trends in the different geographical zones. They also imply that the industrial countries will formulate, in a medium-term perspective, the issues they would like to tackle with the developing countries.

New forms of international co-operation

Four objectives for the new forms of international co-operation:

The growth of interdependence is likely to have two consequences:

- the role of governments may grow because of the increasing number of "decision variables" used and the extension of the areas to which they will apply;

- *seeking efficiency by improving the functioning of international markets;*
- *reducing the vulnerability of domestic economies;*
- *accustoming governments to take account in their policies of the dis-economies they are liable to inflict on others;*
- *taking the institutional measures implied by the renewal of co-operation.*

- the ability of governments to control the international system could decrease because of the internationalisation of activities and the existence of numerous transnational groups.

To the extent that they are tempted to reduce the element of uncertainty by partly closing their economies to foreign trade, governments could encounter resistance since, with only a few exceptions, the countries that try to increase their economic security by means of isolation will only be able to do so at the cost of an appreciable curb on living standards. Consequently, growing interdependence may oblige governments to seek new forms of international co-operation as a means of reducing uncertainties and reconciling differences which may arise when government intervention affects the international market.

The market is an excellent resource-allocation mechanism but some of its theoretical stipulations are inadequately met in reality. These stipulations include: absence of dominating positions, non-interference of policies changing the relative costs of various goods and services, consistency of the implicit market trade-offs between present and future with the trade-offs decided on by the government. Moreover, the market in no way guarantees a distribution of incomes judged acceptable within nations or between nations. The only possible solution therefore seems to be to take the present system and progressively improve it until it is significantly transformed. This implies a continuous complex and lengthy process of change and co-operation.

A few very simple ideas could be central to this new international co-operation.

(1) The primary aim of co-operation between governments should be to seek efficiency by improving the functioning of international markets. There is a great deal to do in this area, whether with regard to the protectionist policies of some countries of the North or the South, use of monopoly positions by some transnational enterprises, restriction of access to markets or resources, or distortions introduced into the relative costs of factors of production.

The operating conditions of markets are also difficult when, as in the case of energy, the various governments make very different trade-offs between the present and the future.

An improvement in the workings of international markets therefore presupposes new rules of the game and codes of conduct both for enterprises and for governments. In the case of enterprises, it is probably relatively easy to make the rules operational. The question is much more complex in the case of governments. The principle of sovereignty often limits the significance of their commitments. Financial solidarity holds between them only in a limited number of cases. Considerable progress will have been made the day governments agree to collective mutual assurances or guarantees, whereby, for example, a group of governments, accept responsibility for compensatory payment in the event of default by one of them. The transformation of the International Monetary Fund into a world central bank, which has sometimes been suggested, raises difficulties of a similar sort. This is not only a matter of supranationality as some tend to see it.

(2) A second aim of co-operation must be to reduce the vulnerability of national economies: food vulnerability due to climatic hazards; vulnerability to shortfalls in the supply of agricultural products, energy or mineral resources; vulnerability to short-term fluctuations in certain prices, export earnings and exchange rates; vulnerability to sudden cut-offs of certain financial flows; vulnerability of small countries to growth of the rest of the world economy.

This effort to limit vulnerability will, as in the past, encounter a fundamental difficulty, that of reducing the short-term hazards without arbitrarily distorting the long-term trend of relative prices. Preferences should therefore always be given either to methods which attack the actual causes of vulnerability, or to solutions which offset the immediate effects without distorting long-term economic trends.

(3) A corollary of these two approaches is that governments should learn to take account in their decisions of the diseconomies which their policies are liable to inflict on others, regardless of their level of development. From both the national and international points of view, it is also desirable to avoid any action which, by separating the price of factors from their social cost, would result in inefficient allocation within the various economies. One of the tasks of the existing inter-governmental organisations should be to evaluate, on a continuous basis, the policies of the different States and to publish their results.

(4) Finally, a renewal of international co-operation presupposes action of an institutional nature. No policy has any chance of being applied with continuity and perseverance if there are not the institutions which will persistently identify the issues involved in adjusting these policies to a changing environment and propose solutions accordingly. In this regard there have been two tendencies over the last twenty years: one has been to increase the number of international organisations and their degree of bureaucracy, the other has been to extend the hierarchy of ranks of those who take part in the work of these organisations in the various countries.

Intergovernmental organisations have thus suffered the repercussions of the growing unwieldiness of national government machinery. Since a large number of governments are involved in most international organisations, it will be particularly difficult to undertake restructuring to remove unwieldiness.

Before there is any further increase in the number of intergovernmental organisations, it is almost certainly important to improve the functioning of those that exist.

- by adapting their structures to the various functions: contact, preparation of information, policy evaluation, consultations, negotiations, programme management;

- by improving decision-making procedures and liaison with administrations and the other groups involved in economic activity (big enterprises, trade unions, etc.);

- by restoring to the executive bodies of these organisations the power to take initiatives and put forward proposals, in other words to be active forces in co-operation which supposes a certain degree of independence.

In addition it seems important to develop functional forms of co-operation between groups of countries with common problems, and with non-governmental international organisations (even if they are partly financed by governments).

3. SOME RECOMMENDATIONS

This section recalls a few of the policy approaches presented earlier. They are presented according to the order of the major themes of this report, but a vital preliminary question is what might stimulate industrial societies to take a positive attitude to the problems of tomorrow.

This section does not attempt to be exhaustive. Its purpose is simply to suggest a few of the possible policy approaches that derive directly from the report and have in most cases already been mentioned. These approaches are presented for illustrative purposes only and they are not intended to be the basis of a detailed examination. They are grouped around the four major themes of this report: the physical limits to growth, the industrial societies confronted by change, North-South relations, world interdependence. But first it is necessary to consider what might stimulate the advanced industrial societies to take a positive attitude to the problems of tomorrow.

Creating a positive attitude to the future in the advanced industrial societies

Making the developed societies aware of the problems and the stakes - an all-important and complex task for governments.

The attitudes of a society are not ordained. They are the result of complex and uncertain processes. The least that can be said is that governments can tackle the problem at very different depths.

. At one extreme, a discussion of demographic policies cannot be avoided to the extent that certain demographers consider that the age structure of a population directly affects confidence in its own future and its ability to meet new challenges by proposing new responses. Thus some people have suggested that the maintenance of a population in the developed countries which is sufficiently young with regard to the above, is more important for the development of their relations with the Third World than the disadvantages which some would attribute to a contribution to world population growth by the developed countries:

. At another level, everything must be done to improve the knowledge of other cultures and of economic and social phenomena. It may be wondered whether the governments of the OECD countries ought not to review their education programmes at the various levels in the light of the long-term issues described in this report.

More travel abroad by young people and especially to developing countries, translation of writing from different cultural areas, distribution of cinema and television features made or filmed in these areas, all this would help towards a greater awareness of the world outside.

As to efforts to spread a knowledge of economic and social phenomena, these will not magically generate a social consensus, but they will serve to anchor policy debates more deeply in the reality of facts. Here one should probably emphasise the danger represented by the ignorance of economic facts on the part of most citizens of the developed countries.

. At a more immediate level, a wide-reaching international television programme on world economic problems ought perhaps to be launched in the OECD countries: the energy crisis, industrial redeployment, the difficulties of the Third World, and so on. The fact that the same programme would be seen by viewers in a great many countries might cause a salutary shake-up of public opinion in general.

Avoiding or overcoming transition problems involving natural resources and the environment

As regards natural resources and the environment, nothing is more important than forceful energy policies, but strategies are also necessary in other fields.

. In association with the Third World and the East European countries, the OECD countries should step up their programmes of fundamental research on the climate and on the interactions between the climate and human activities.

. In the field of energy, strongly sustained policies for energy conservation and for the development of coal and nuclear power are necessary in order to limit the risk of a major energy crisis. To enable themselves to conduct such policies, governments need to increase their efforts to inform public opinion about the reality of the problems.

. As regards non-energy mineral resources, the establishment of a permanent international information centre would probably make it easier for governments to keep track of the trend in reserves and resources and to be alert to the risks of inadequate investment in this sector.

. Finally, certain OECD governments should review their soil conservation policies in order to take account of the uncertainties surrounding world agriculture in the first half of the 21st century.

Conducting the change in the industrial societies

The approaches concern :

- better co-ordination of counter-cyclical policies;

Where macro-economic policy is concerned:

(1) There is a possibility that a better co-ordination of counter-cyclical policies among the main OECD countries would permit better utilisation of resources and improve the opportunities for growth. The result would be a reduction of cyclical unemployment which is due to under-utilisation of production capacity.

- *dissociating incomes policies from the functioning of the labour market;*
- *more information about the factors underlying structural changes;*
- *reconsidering the efficiency of the Welfare State;*
- *giving enterprises the means to change to new activities;*
- *redistributing responsibilities as between central, regional and local levels.*

(2) At the same time, strenuous action should continue to be taken against unemployment due to the cost of labour. Such action might centre on:

- growth of wages and indirect wage costs in real terms;

- the search for a new trade-off between income redistributions caused by a rise in the minimum wage and those which are caused by other means (relief from social insurance contributions for the low-wage groups, negative tax, etc.);

- the tax methods for financing the nation's social overheads;

- the acceptance of pay differentials between regions and between sectors and the increased flexibility in the relative wages of the different categories of workers.

Such measures are not incompatible with action to increase mobility on the labour market or temporary measures to make changeovers in industrial activities socially acceptable.

Where structural adaptation policy is concerned:

(1) Given the foreseeable trends, there are a number of areas in which the advanced industrial societies need to improve their information.

- The concepts used in studying the trend of service activities are totally inadequate. They do not differentiate clearly between the users of services - consumers or enterprises - or between the different kinds of production unit that provide them. Consequently, it is not possible to make precise analyses concerning employment.

- Similarly, in many developed countries, the systems for supplying information on industry do not seem suited to the requirements for decision-making by governments or even by enterprises at a time when the internationalisation of activities is broadening the necessary field of vision considerably. Information should be concerned with prospective analysis of supply and demand in market segments of significance for industry and with the level of relative costs of the main factors of production in all the countries of the world.

- If the pattern of time use is what characterises a life style, it would seem desirable for the governments of the advanced industrial societies to be in possession of detailed studies of the time budgets of the various population categories. It would be useful to know the relationships between these time budgets, the relevant incomes and attitudes with regard to values.

(2) In many OECD countries, moderate growth is likely to raise the problem of the efficiency of the Welfare State, in other words a better management of public expenditure. This problem has three aspects:

- How to make individuals aware of the costs they entail when they consume this or that public service. In the present situation, certain public services like health and education have become almost unmanageable.

- How to develop efficient methods for managing the budgets of governments. Here there can be no question of transposing the management methods of big firms to the government sector, because of the diversity of governments' aims and the differences in power relationships.

- How to frame integrated social policies which, instead of juxtaposing measures specific to the different areas, co-ordinate them in accordance with their impact on given groups.

(3) Creating the economic conditions which will enable enterprises themselves to make most of the changeover to new activities will reamin one of the major tasks of governments in a period of major structural changes:

- A first requirement will be for governments to ensure the efficiency of the market's mechanisms by preserving competition, internalising external effects, cutting back those of their interventions which distort the price system, and by reducing as much as possible the rigidities that impede factor reallocation.

- Experience has shown that rectification of ill-adapted production structures after the event is costly in both economic and social terms. Consequently, all opportunities for preventive strategies should be taken, but with great caution, since experience has shown that the market is generally better than public administration at picking out the winners and loosers from the range of potential new activities.

- Preventive action on structures can be built into more general policies like assistance to research, development and innovation.

- Insofar as sufficient self-financing capacity appears to be one of the pre-requisites for adaptability of enterprises, it may also prove necessary in those OECD countries where certain groups strongly dispute the legitimacy of profit, to take vigorous steps to spread ownership of firms' capital widely among the population.

(4) Finally, the report has no more than touched on a problem which is nonetheless of great importance for the evolution of the advanced industrial societies, namely their territorial organisation. In most countries the urban and regional administrations are located in a manner which corresponds neither to a functional distribution of responsibilities between the government and local authorities, nor to the logic of modern modes of transport. Besides, an increased search for cultural identity at the regional level has appeared in a number of countries, in reaction to the movement towards centralisation and uniformity dictated by economic and technological evolutions. This situation contributes to the complexity of administrative practices and to a feeling of deep dissatisfaction with government services.

Facilitating the development of the Third World

A few suggestions on how to contribute to the Third World's development :

- *improved access to medium- and long-term loans for Third World countries;*
- *adoption of measures to improve the effectiveness of aid;*
- *a policy for industrial development and technology transfer;*
- *action concerning commodities and especially raw materials.*

(1) A first group of suggestions concerns financial flows:

. It seems important for the developing countries to have access to medium-term loans to facilitate equilibrium in balance of payments and to long-term loans for developments which are not directly linked to specific projects.

. Where aid is concerned, every effort should be made to increase it in quantity and quality, this aid being progressively concentrated on the poorest countries whilst the more industrialised Third World countries would begin to contribute. There should be a larger proportion of aid to facilitate the development of agriculture and rural activities, with priority for small operations with high social returns. Priority should also be given to assistance in the following fields: farming in non-irrigable areas; development of technology for ecologically fragile zones; the establishment of compensation funds to protect farmers against increases in fertiliser prices in times of shortage. Sufficient aid should be provided to finance, in some cases for several years, the operational expenditure that follows the entry-into-service of aid-financed investment projects. Finally, with the growth of the South's financial deficit and the widening gap between the demand expressed through the market and nutritional needs, the importance of food aid will increase.

. Another suggestion concerns the creation of an International Foundation to distribute a proportion of the official aid supplied by the developed countries and the OPEC countries. This foundation, which would receive from governments a minimum annual amount guaranteed for ten years, would be administred by eminent persons appointed for life, having great moral authority and representing both the North and the South. They themselves would elect a governing board. This arrangement would leave the foundation free to distribute the relevant share of aid without any constraint as to political expediency, whether with regard to the governments of developed countries or vis-à-vis the governments of Third World countries.

. It might be useful to extend the system of regional clubs and assign them the task of setting up development programmes which would be partly financed by official aid.

(2) A second set of suggestions centres on industrial development and the transfer of technology:

- Whilst everying should be done to give the Third World countries easy access to the long-term capital, the developed countries should conversely limit their lending on preferential terms to finance industrialisation.

- It would be useful to set up one or more international foundations to sponsor Third World centres of applied research in different sectors of technology. The assignment of these centres would be to develop modern technologies suited to the social, economic and cultural conditions in the various Third World areas. The foundations might also commission multinational enterprises to carry out research into adapting technologies to the situations that exist in the Third World.

- Harmonious development of trade in industrial products must constitute a common objective of the OECD countries and the rapidly industrialising Third World countries. Not only should everything be done to stem the rising tide of protectionism and even to reduce it both in some developed countries and in some developing countries, but steps should also be taken to make the rules highly transparent and very stable, so as to enable enterprises to establish plans for medium- and long-term expansion.

- Participation of industrialising countries in information systems on world industrial trends is highly desirable, but the procedures for producing this information would have to be completely separate from those for negotiations concerning trade in industrial products. For this reason, it would probably be preferable for an information system of this kind not to be managed by a body with intergovernmental status.

(3) The third set of suggestions concerns commodities and raw materials:

- Price stabilisation by means of buffer stocks may be desirable for a few commodities, but the extension of mechanisms for stablising export earnings also seems an interesting avenue to explore, provided that the international provisions are supplemented by national measures to ensure that the benefits are passed on to producers.

- If the present inadequacy of investment in the raw materials sector were to continue, institutional measures would have to be envisaged to facilitate the financing of such investments and to reduce the political risks by insurance mechanisms.

- To prevent discriminatory practices that restrict certain countries' access to raw materials, it might be possible to establish fixed agreements which countries accept with respect to both their mining legislation and the rules to be observed for mineral exploitation.

Managing global interdependence

Management of world interdependence will be the end result of a long learning process and the pragmatic, but active, pursuit of this process is essential. Nevertheless, a few recommendations can be put forward.

The measures suggested in the preceding section should logically be incorporated into the broader set of initiatives to be taken concerning world interdependence. We shall not return to approaches and suggestions that have already been made under other headings but simply put forward a small number of proposals.

(1) Reshaping the administrative organisation of each developed country to take account of increasing interdependence with the rest of the world. Individual solutions will vary infinitely, but it is important that the developed countries should press ahead with reforms - many of which are under way already - in order to acquire the means of obtaining information on the outside world and to establish the appropriate internal bodies to help them prepare their decisions. This will enable them to take equal account of external constraints and effects in framing their national policies and to be useful participants in major international negotiations.

(2) Generally reviewing the present workings of intergovernmental organisations, in order to identify the assignments which each should carry out in a long-term perspective and to think of changes in decision-making procedures and internal structures that would enable them to function better.

(3) Improving the organisational framework for international trade to make it as transparent and stable as possible.

(4) Progressively reforming the international system of liquidity creation so as to make it a framework which will facilitate the development of investment and trade and the co-ordination of macro-economic policies.

(5) Establishment by oil-producing and oil-consuming countries of a viable framework for ensuring a smooth transition to the post-oil era for the producer and consumer countries alike.

(6) Continuing exercises in prospective analysis on a world scale while avoiding two pitfalls: that of giving any one team a virtual monopoly on this kind of exercise, and that of increasing the number of such projects without allowing them the time needed to master excessively complex problems. But links should be established between the different teams, so that from this investigation of the future the various governments may derive a common awareness of the long-term issues that face them.

But, as was pointed out in Part V, the management of world interdependence, which demands a political will, can only come about through a long and difficult process of learning; and the pragmatic but active pursuit of this process is probably more important than any specific recommendation, which, because of the magnitude of the issues, is at once too general and too limited.

A starting point

The work of INTERFUTURES should be the starting point for increased allowances for the long-term in government policies, as a result of:

- *searching investigation by each country;*
- *consultations between OECD countries.*

If the many challenges which the advanced industrial societies will have to meet in the next half-century are to be progressively mastered, nothing is more vital than the establishment in the foremost societies of a solid political leadership capable of taking into account both the long-term issues and the interdependence between the various areas.

Yet the fact has to be faced that in today's democracies the plans which pay quick dividends have more chance of being carried out than other, more important ones whose benefits are long-term. In election campaigns the long-term issues are often pushed into the background or not mentioned at all, since politicians are convinced, perhaps rightly, that voters look no further than their own private interests and their immediate environment. Things will probably continue this way until the political leaders succeed in producing a vision of long-term objectives that will win the deep conviction of the majority of citizens, but conversely those same political leaders will need an essential minimum of support from the population in order to embark on this course.

The possible futures described in this report show not only the importance of political dialogue in the democracies of the developed countries, but also the value of informing the public very extensively about trends in the world as a whole.

Scientific circles, the education system and the media should help in this priority task.

. Where the scientists are concerned, it is not a question of their setting up as specialists in fields other than their own, but of helping as objectively as possible to inform the public of the contribution which the physical, biological or social sciences can make to an understanding of world issues.

. The education system is a key element of modern democratic societies. In a world of growing interdependence, a knowledge of foreign countries, different cultures and other languages is as crucial for the continental nations like the United States as for the small OECD countries. Furthermore, in societies where the challenges of the future are liable to be political, economic and social, it is probably necessary to think again about how to combine the sound and precise technical training that international competition demands with the outward orientation necessary for a citizen of a democratic country.

. Finally, the mass media have a responsibility in regard to the dissemination of information, critical assessment of policies and the introduction of constructive proposals. Often they have simply picked on the sensational aspects of the issues of the future, be it to announce the end of the world or to reassure the uneasy, but they need to do more than disseminate futurological trivia. They must contribute to a realisation by the citizens of developed countries of the tasks that await them and the problems they will have to resolve.

The democratic systems of industrial societies have deep and secure roots. Despite their inadequacies they should show themselves able to face up to the possibilities the future holds. They can ensure that no process of ageing, sclerosis or withdrawal threatens those societies in their coexistence with the young societies of the Third World and with the socialist world of East Europe.

This report will have achieved its aim if it succeeds in convincing the main active forces in the developed countries to undertake extensive efforts to spread the word about the challenges of the future. Not to develop a sort of resignation to the inevitable, but to generate creative responses. Even if many question remain unanswered or if some of the points of view expressed are debateable, the work of INTERFUTURES should be the starting point for increased allowance for the long term in the policies of governments. For this, two things are necessary:

- that each country, on the basis of this report, look searchingly into the specific long-term issues with which it will be confronted and then undertake the necessary additional studies;

- that the OECD countries then consult one another on the policy conclusions they have drawn from this vast investigation of the long term.

ANNEX I

ORGANISATION OF THE INTERFUTURES PROJECT

Unfortuntely it is impossible to mention all those who have directly or indirectly participated in the INTERFUTURES project. Nevertheless, the few details below indicate the main features of the organisation established to realise the project.

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Chairman : S. OKITA (1976 - April 1977)
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Counsellors : R. DOBELL and M. SAKAMOTO (after the departure of Y. Kogane)

In addition to the permanent team, about forty consultants from both developed and developing countries made significant contributions to the project in various subject areas.

Advisory Panel :

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Members : E. ALLARDT, R. ARON (1976-September 1977), D. BELL
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